ANNUAL REPORT

OF THE

CHIEF SIGNAL OFFICER OF THE ARMY

TO THE

SECRETARY OF WAR

FOR

THE YEAR 1887.

IN TWO PARTS.

PART 1.

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REPORT

OF THE

CHIEF SIGNAL OFFICER.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, September 7, 1887.

The Honorable the SECRETARY OF WAR.

SIR: I have the honor to submit for the fiscal year ending June 30, 1887, the regular annual report of the operations of the Signal Corps.

It is proper to first note the death of my predecessor, Brigadier and Brevet Major-General William B. Hazen, on January 16, 1887, of disease contracted in the Service. General Hazen's distinguished career as a soldier in the line was supplemented by five years' service as chief of this Corps, during which period most important changes and improvements were inaugurated, especially the prediction of cold waves and the display of weather signals.

In addition to its chief the Signal Corps also lost by death, on March 14, 1887, 2d Lieutenant Joseph S. Powell, an officer who had particularly distinguished himself by his skill in meteorological forecasts.

The present Chief Signal Officer, owing to the ill health of General Hazen, assumed charge of this office as senior assistant December, 1886, and as such retained the supervision and control of the operations of the Bureau until nominated by the President on February 16, 1887, to the vacant office of Chief Signal Officer and confirmed therein by the Senate March 3, 1887.

DIVISION OF MILITARY SIGNALLING.

The Chief Signal Officer is charged by law with the general signal service of the Army and with the equipment and management of the field telegraph used with active forces in the field. With such responsibility he urgently invites attention to the existing condition of affairs, as it is evident that unless opportunity is offered to keep abreast with modern improvements in the management and use of the electric field-telegraph train and in drilling and instructing detachments in this and kindred signal duties any emergency would develop most unsatisfactory and inefficient conditions.

The important duties pertaining to the Meteorological Division of the Signal Corps have, unfortunately, been permitted to completely

overshadow the duties of military signalling which, in time of war, would be by no means the least important function of this Bureau. For several years there was not even a division of military signalling in the Office of the Chief Signal Officer, and it is only within the past eighteen months that the slight and perfunctory attention paid to this branch of the Service has been rectified. This has resulted partly from untoward causes, but it may be attributed in no slight degree to the fact that Congress has for several years failed to make adequate provision even for the most pressing needs. That careful and liberal attention paid to the proper military functions of a signal corps, particularly with reference to means of electrical communication in the field, affords substantial advantages in case of war, is patent to foreign governments, although our own appears to believe that on this score the future can be abundantly provided for by extemporized makeshifts. In these days of rapid military movements the great value of sure, speedy, and secret methods of communication between co-operating forces cannot be questioned, and it should be equally obvious that the personnel of an efficient military signalling establishment should be possessed of a high degree of technical skill, which is essentially necessary to insure that extended use of electrical communication so essential between the various commanders of columns and lines of campaigning troops. Despite the advisability of experiments and improvements for such active service, the Chief Signal Officer regrets to say that the field-telegraph train of the Signal Corps is practically the same now as that used nearly a quarter of a century since.

Decided improvements in this train are practicable and necessary. With advance of mechanical devices, the equipment, battery material, instruments, etc., should be more compactly and satisfactorily arranged, and, in order that the advantage of a field train should not be too dependent on a particular pattern of wagon, the special telegraph instruments and apparatus should be so arranged that they could be instantly and easily attached in case of necessity to the standard Army ambulance. The wire wagon can safely be dispensed with, provided such devices are perfected that the distribution and collection of wire can be made from a reel planned so as to fit the ordinary Army wagon. In like manner, implements used for planting lances or building field lines should be arranged with reference to use and stowing in connection with such ordinary wagons as are available for the transportation of lances.

The use of portable field-telephones with an insulated, double conductor is a method of field communication which should be perfected to the highest degree, as being the only possible method suited to battle conditions; but unfortunately lack of funds prevents experiments or purchases for that particular purpose, so that the office, while familiar with two devices, the Knapsack and Eccard, is compelled to confine itself to theoretical rather than extended practical knowledge.

The system of visual signalling remains the same, with reference to flags and torches, as in war time. Efforts are being made, with gradual success, to simplify the models of the old and cumbersome flag-kits, and to replace the torches by a more satisfactory and economical element. To this end the weight and length of staff have been somewhat reduced, and the regulation flag-kit is supplemented by a small, light, practice kit, as being more economical than, and equally as serviceable as, the regulation outfit for short ranges. Experiments have been made, with a moderate degree of success, with the view of replacing the old, crude torch by one made of asbestos or brickwood. The former of these patterns was but moderately successful, but the latter has proved so satisfactory on experimental tests that probably brickwood will be regularly adopted. Torches, however, must largely give way in the future to flash lanterns, which not only avoid defects of the more expensive torch, but are more compact and simple in operation, and are easily effective at greater ranges than the ordinary torch.

The Oatman flash lantern, now under experiment by the Corps, is judged to be quite satisfactory for limited ranges. In connection with night signalling, the office has under consideration a signal lantern that is expected to serve for greater ranges than have before been possible, in which a very brilliant light is obtained by projecting a spray of oil through a spirit flame.

The requirements of signalling on our western frontier demand methods available for greater distances than are possible for flag-signals, and in consequence the use of the heliograph is rapidly growing at our frontier posts, and has become a necessity for field campaigning. The demand for these instruments is far beyond the ability of this office to supply, owing to the limited appropriations lately granted. The fact that the greater part of the trans-Mississippi country is favored with almost continuous sunshine, renders it certain that this instrument for coming years will hold its own in favor and usefulness in that section of our country, while its unequalled range renders it also an appropriate, if not indispensable supplementary instrument, for use in regions less favored in amount of sunshine. The Chief Signal Officer has under consideration the construction of a heliograph to combine the best elements of the Grugan (as modified by Lieutenant Purssell) as well as of the Bigbie and Mance, the last two devices used in the English and Indian Army. In constructing a standard heliograph, which shall be capable of satisfying the various and difficult requirements imposed by the nature of our service, it is considered most desirable that repairs for instruments rendered unserviceable in the field shall be made certain and practicable by the plan, so successfully carried out in the great manufacturing factories of the world, of making every like part of the heliographs strictly interchangeable.

The field-glass and telescope in use in this Service, while well suited for each of their special work, do not, in either case, prove satisfactory

for general use. To avoid burdening an officer with two glasses, this Bureau looks to finally equipping selected parts of the Army with binocular telescopes, in which the extensive field of the marine-glass is combined with the great powers of the telescope, so that by a slight sacrifice of qualities peculiar to each glass the better points of both are substantially preserved.

Lack of appropriations forbids purchases of, or experiments in, rockets, signal bombs, or colored lights, most appropriate and important adjuncts to the efficiency of a well-equipped signal corps, and in the invention of which devices America has always excelled.

The question of ballooning has received no attention from the Service beyond the compiling of information for use in case of need.

The signal tower has been injured by exposure, this office being without means to properly care for it. The extensive use of portable signal towers is hardly probable in this country, and the necessity for further equipment in this direction seems more than doubtful.

The homing-pigeon as a means of communication has received little or no attention from the Service of late years. A stock of these pigeons has been generously placed at the disposal of the Chief Signal Officer by breeders, and it is intended to make careful experiments during the coming year, since such will not entail any considerable expense. Careful attention has been paid to these birds both in France and Germany, so that in the local military centres of each country well trained birds, perfectly reliable for distances up to two hundred miles, are to be found. The necessity for such dispatch-bearers is not pronounced in this country; but with a view to familiarizing the Service with these pigeons, as is possible at a nominal cost, the Chief Signal Officer has directed that experiments be made from Key West toward Cuba, with the expectation, based upon the opinion of experts, that by training these birds in flights from the seaward, would enable a United States squadron in the vicinity of Havana to communicate rapidly and certainly with the naval station at Key West. If such flight is possible from Cuba, it could be eventually extended to the Windward Islands, even to Nassau.

As far as possible, the Chief Signal Officer has been kept advised of the methods and improvements which are being made in the signal corps of foreign armies, not only as regards signalling by flag and heliograph, but also with reference to the best methods of maintaining communication between the various divisions of an army in the field and its commanding general. The officer in charge of the division of Military Signalling has been charged with the study of foreign organizations and appliances, particularly with reference to the construction and equipment calculated to best fulfill the varied and important conditions which active service would entail upon a signal corps.

Attempts, however, to seriously profit by foreign improvements are rendered impracticable by the reduction in appropriations for military

signalling, which now amounts to less than $25 for each military post in the country, while there are at this time on file for signal equipments needed for practice and proper equipment, requisitions to an amount exceeding $125 for each military post. In these cases the Chief Signal Officer is obliged to leave unfilled all but the most urgent requisitions, and at times has found himself unable to provide, at once, equipments urgently needed for use in the field.

At present the Chief Signal Officer finds himself unable to care even for valuable field telegraph trains which have been bought and equipped at the expense of many thousand dollars, and for which at present there is even difficulty in obtaining suitable protection from the weather, as the commanding officer at Fort Myer, where they are stored, has requested the sheds for other use. The regular use of these trains would not only keep them in serviceable condition, but would render their use at any desired moment practicable, which is not possible at present.

As regards the personnel for service in the strictly military branch of the Signal Corps, there cannot be two opinions that special training and drill are necessary to ensure officers and signal men whose services can be relied on in the field. As far as the discretion of the Chief Signal Officer extended the plan has been followed of supplying military posts to the westward of the Mississippi River with signal stores, rather than those to the eastward, since the conditions of active service under which signal work is to be performed are more frequently to be expected in the former region than in the latter. The method which has been followed in the Army of appointing post signal officers, with orders to practice military signalling until the garrison is qualified, has been fostered by this office as faithfully as possible, but the results can scarcely be considered satisfactory. Although reports received indicate, theoretically, that the Army at large is competent to perform military signalling, yet experience has shown that such is not actually the fact. The Chief Signal Officer needs only to refer to the conditions which obtained during the Arizona campaign of General Miles in the fiscal year ending June 30, 1886. This general officer had at his disposal the whole Department of Arizona, with its posts drilled in military signalling (as shown by reports on file), yet at the commencement of an Indian campaign General Miles found himself compelled to urgently request, by telegraph, expert signal men to perfect his field communications.

This Service, at an expense of $5,663.53 from appropriations in the sundry civil bill, was able at once to furnish, for its work of Army signalling, men and appliances which made the service most useful and effective, and contributed materially to the speedy and successful issue of the campaign.

The appropriation for signal equipments and stores for the use of the Army for the fiscal year ending June 30, 1887, was but $3,000,

while the actual necessities of the service required the issue to the Army of articles whose money value amounted to $6,484.31; the excess of $3,500 being supplied from the stock kept on hand for contingencies. For the coming fiscal year the appropriation is again $3,000, but the current needs of the Army demand articles aggregating a money value of $13,560, or over $10,500 more than the amount of the appropriation. In consequence of this demand, not only is the appropriation entirely inadequate, but the entire stock of military stores on hand will not be sufficient to supply the deficiencies. Since 1873, when the surplus amount of signal equipments which had accumulated during the war was practically exhausted, until 1883, when the appropriation was materially reduced, the appropriation for the needs of the Army averaged $10,350.

In consequence of insufficient means the Chief Signal Officer has also been unable to supply and arrange, as thoroughly and carefully as he could desire, the electrical appliances necessary for convenient and proper dispatch of practice in connection with the rifle ranges of the Army. It is hoped that increased appropriations for military signalling may be allowed by Congress, so that this very important adjunct to the efficiency of the Army may be fostered to the greatest possible extent. The necessity of properly and immediately supplying troops for Indian campaigns with heliographs, obliges the Chief Signal Officer to urge strongly, for the current year, a deficiency appropriation, and in the interest of target ranges, which are not properly fitted up, to no less strongly urge the increase of the appropriation for the coming fiscal year to $7,500, which with strict economy and careful consideration may possibly be adequate.

The number of officers under instruction in military signalling during the year has varied monthly, at military posts, from 14 to 51, and of enlisted men from 433 to 686.

It appears evident from the record of this and past years that, instead of the Army being properly and efficiently drilled in military signalling, there is not an average of an officer to a regiment who is competent to transmit signals—by sun, flag, and torch—day and night, except those who have passed through a regular course of instruction in direct connection with this office.

The Chief Signal Officer hazards nothing in saying that this condition of affairs—where a lack of sufficient training and skill in most instructors is supplemented by an evident want of interest in the Army at large—must result in the constant deterioration of the efficiency of instruction in military signalling throughout the Army. The only remedy for this is to be found in the detail of an officer of the Signal Corps with a small number (say four or six) of men, as instructor at the great schools of the Army, at Fort Leavenworth, Fort Monroe, and Fort Riley. One officer of the Signal Corps would be sufficient to give this instruction, as he could be quartered at the school where

the largest number of officers were stationed, and could perform his duties of instruction at the other schools at such periods of the year as would least interfere with special studies. In order that the efficiency of officers at large should be tested from time to time, an officer of the Signal Corps should be detailed to visit the larger posts of the Army for the purpose of inspection and examination, as to the condition and efficiency of military signalling.

While the retention in service of men well skilled in military signalling enables the Chief Signal Officer to now meet any ordinary demands made upon him, yet it is evident that, unless drill in military signalling be carefully kept up under charge of officers peculiarly interested in the Service, two or three years will find the entire Army without a party in it properly skilled in the use of modern appliances. The maintenance of signal drill as at present throughout the Army, while subserving a most useful purpose in forming a body of partly skilled men who, under the care and drill of an experienced officer, could soon be fitted for any service, can by no means be considered a proper substitute for a small but thoroughly efficient signal corps. But the officers of the Signal Corps themselves, deprived, as they now are, of all means of regular instruction and drill, will soon become unfitted for practical work under difficult conditions; a state of affairs which should be guarded against. A few years since the Signal Corps of our Army was the most efficient in the world, but now, while foreign governments, impressed with the importance of such service, increase and improve means of signalling, the United States diminishes and neglects it.

This system of dependence on the Army for officers and signal men, which operates only indifferently in time of peace, is open to the fatal objection that even should the officers and men be thoroughly instructed (which is impossible, however, under present conditions), that in time of war the attention of the Army, especially the officers, would be naturally devoted to its legitimate work in its specialty of arms, and in place of an efficient force for signalling would exist the necessity of creating a new body out of new material.

The records show that less than one officer out of eight of the line of the Army has received any instruction in signalling during the year; less than one in fifteen one hour's instruction monthly, even in the most elementary branches. Over one-eighth of the officers instructed have had no field practice, and less than one-fifth of the whole have had night practice, while only four officers in the Army out of one hundred and fifty-three instructed have been drilled with flag, torch, and heliograph. There are no less than nine regiments in which no officer has received instruction during the year, six other regiments in which one officer, only, has been instructed, and seven regiments in which two have been instructed.

It thus appears that in nearly one-quarter of the regiments of the Army no instruction has taken place, and in one-half practically none.

Out of one hundred and eleven posts, eighty-five have neglected instruction one or more months; twenty-three, six or more months; and at two posts no instruction has been had during the year.

2d Lieutenant B. M. Purssell, Signal Corps, Assistant, was relieved March 22, 1887, from charge of the Division of Military Signalling by 1st Lieutenant R. E. Thompson, 6th Infantry, Acting Signal Officer, who remained in charge at the end of the year, and whose valuable report forms Appendix No. 1.

METEOROLOGICAL WORK.

The duties of a civil character which, by law, are to be performed by the Chief Signal Officer of the Army, under the supervision of the Honorable Secretary of War, have naturally engrossed the greater part of the time and energies of the officers and men of the Signal Corps.

The death of the chief of the service, and of the officer who managed for many months the Stations Division—in many respects the most important division of the Service—necessarily left the successors of these officers at a disadvantage, particularly as the sub-appropriations for telegraphic reports, for the mileage of officers, and for the transportation of men, were practically exhausted. This embarrassing and critical condition continued for the last seven months of the fiscal year, as the possibility of relief from Congress failed, owing to the Deficiency Bill not becoming a law.

Assuming charge, as the present Chief Signal Officer did, under the trying conditions just enumerated, he found the Service subjected to many restrictions, which hampered his action and materially impaired the efficiency of the Service. The failure of the Deficiency Bill, which would have remedied these defects, necessitated the cutting off of many reports which for years had been regularly distributed in the interests of agriculture, commerce, and navigation. That these reports were really deemed of great public value was most conclusively shown, not only by the comments of the press, but also by the action of the boards of trade and chambers of commerce of Boston, New Orleans, Saint Louis, and other smaller places, which organizations proposed to assist the service in this emergency, as did also the *Saint Louis Globe* and *Cincinnati Commercial Gazette*; but when such generous and public-spirited offers were declined, they paid from their own funds for the transmission of selected special reports, which they gave to the general public of their respective localities.

The inability of the Chief Signal Officer to move any man of his command during the last six months of the fiscal year, proved most injurious to the efficiency and discipline of the Service. In one case at least, the death of an observer was due to his retention, contrary to medical advice, at a station from which the Chief Signal Officer was unable legally to move him. In special instances, where the inclina-

tion of the men coincided with the interests of the Service, the Chief Signal Officer was able to make certain changes of station with the proviso that the journeys should be made at no expense to the United States, and that the cost should be borne by the observers moving. The limited interchangeability of sub-appropriations, elsewhere recommended, would have obviated such an unfortunate condition of this branch of the public service.

WEATHER FORECASTS, COLD-WAVE AND STORM WARNINGS.

Weather forecasts, cold-wave and storm warnings have been issued regularly during the year, and so continuous and efficient has been the telegraphic service, that in no instance has this office failed to put forth its regular predictions. There has been a growing demand for these forecasts, which indicates in a striking manner the confidence which, despite occasional errors, is placed by the general public in the accuracy of these predictions.

The plan of limiting the predictions to states instead of larger arbitrary districts has proved most satisfactory to the general public, though entailing greater labor on the Service and demanding a higher degree of prompt and accurate judgment from the predicting officer. In some cases the state, when a large one, has been divided into sections. The Chief Signal Officer has been strongly urged to furnish special predictions for cities, towns, and corporations, a work which so far this office is unable to satisfactorily undertake, owing to the limited time which elapses between the receipt of the telegraphic reports and the hour at which the predictions must be issued to the general public. The Chief Signal Officer hopes, however, during the ensuing year to make arrangements which, in addition to providing the Northwest with more accurate warnings of coming cold-waves, will also furnish the great centres of population with special predictions. This latter want, however, has been met to a certain extent through the enterprise of the *New York Herald* and *Tribune* for New York, and the *Commercial-Gazette* for Cincinnati, which, having meteorological editors, supplement the general predictions of this Service with special prognostications for the country immediately adjacent to these cities. The Blue Hill Observatory, near Boston, has also, through the enterprise of Mr. L. Rotch, furnished supplementary predictions for southeastern Massachusetts. As is shown, elsewhere, the Indications Officer gives but a minute to each state, so that it is reasonably to be expected that the meteorological experts of these papers and institutions, having relatively much more time and the same reports at their disposal, should make local predictions with greater accuracy than is done by this Service, since the work of predicting is based on scientific knowledge and principles accessible to every student of meteorology. Comparisons between the work of the central office and these special preditions are not, however, always to the disadvantage of this office,

for what the amateur meteorologist gains in increased time for deliberation and diminution of territory to be predicted for, is probably compensated for by the greater experience of such predicting officers as have applied themselves solely to this work. It is hoped, however, that continued special interest and prolonged research in meteorology may enable local experts to issue predictions for circumscribed areas so much superior to those of this office that they will entirely satisfy the public needs. Such an end would be most desirable, not only in the interests of the general public, but in relieving the overtaxed Indications Officer from the excessive amount of work which now devolves on him. It may be added that although the general indications of this Service have become its marked feature, and is that part of its duties which is best known by the general public, yet such duties are supplementary and voluntary, since there is no law that entails this work upon the Service, which was originally organized simply to indicate the approach and force of storms.

The tri-daily indications are now issued for a period of thirty-two hours, so that they hold good for twenty-four hours, or more, from the time they reach the general public. This increase in the length of hours, while manifestly in the public interest, has naturally resulted in a reduced percentage of verification, as might be expected; the diminution from such cause amounting so far to seven per cent. It is thought that with carefully selected indications officers the diminution in accuracy which has resulted from an increase in time, may be eventually compensated for by increased skill through study, research, and practice. The difference of successful percentage between predicting officers is very marked, as is shown by the fact that between the general standing of the best predicting officer and of the poorest there is a difference of 13.7 per cent. It is thus to be seen how greatly such public interests as depend upon accurate forecasts, must be benefited or prejudiced by any action which tends to either raise or lower the standard of efficiency of these officers.

It has been a subject of complaint that the indications of this Service have not improved to the extent expected, and since the statement has been officially put forth that the indications are made by the same officers who have made them for years, it is presumed that the public labors under this same misapprehension. Such is not the fact, as within the past three or four years the relief of the old officers detailed from the line of the Army has been forced upon the Chief Signal Officer by legislative action. In consequence, it followed that the young officers of the Signal Corps, who have only within the past year or two received any extended instruction in meteorology, have been assigned to this important duty. Within the past year three officers have necessarily been assigned to indications work who never before have performed duty of this character. It consequently follows that through restrictive legislation the Chief Signal Officer finds himself com-

pelled to permit the new officers to serve their apprenticeship in predicting at the expense of the whole country. It has occurred, as might be expected, that the novices in the work at times made errors that subjected the Service to criticism, which, well merited in such cases, cannot be considered valid criticism of the methods followed by the Service. It follows, too, that not every officer who satisfactorily performs practice indications work is well qualified for actual work. Not only is the predicting officer weighed down with a strong sense of responsibility in the performance of this difficult and vastly important work, but he is also required to decide with as great degree of accuracy instantly, as though he had ample time at his disposal. The officer, as a rule, predicts for forty different districts, for which three elements, temperature, weather, and wind must be determined. As the time for these predictions is strictly limited, it necessarily follows that each state or district receives less than sixty seconds' consideration at the hands of the indications officer, and each element is predicted with not over twenty seconds' consideration. Officers who have done creditable practice work have not infrequently failed when called upon to decide instantly and officially future weather conditions for the whole country.

The percentage of successful indications for the year ending June 30, 1887, will be found in Appendix No. 2. The general percentages have been: for weather, 74.5; wind, 69.1; temperature, 74.4, a general average of 73.9. It should be understood that in determining the general average the weather is given the weight of 5, temperature 4, and the wind of 1; a method inaugurated by my predecessor. In determining their weight, these elements have been considered with reference to the importance laid upon them by the general public. For comparative purposes there should be added to this general percentage of 73.9, 7 per centum, such having been satisfactorily determined as the degrees of decrease in accuracy, caused by the extension of the period of prediction from twenty-four to thirty-four hours, which would give, in comparison with former standards and records, a percentage of 80.9. While this result is disappointing to the Chief Signal Officer, the reasons therefor have been clearly set forth elsewhere. Attention may be invited to the fact that (excluding the Pacific coast region) the highest percentage ever made by this Service was in 1883, when the percentage was 89.1, at a time when the few officers, finally selected from a large number of detailed applicants, performed in the most creditable manner the indications work of this Service.

The unfortunate experience of this office in late years, as regards the character of its predictions, illustrates strongly the inability of even the best inspectors, who are entirely unfamiliar with the work of this Service, to pass intelligently upon work of this character. In Miscellaneous Document 39, Senate, 47th Congress, 2d Session, will be found a report from the Inspector General of the Army, setting forth the lack of willingness of meteorological experts to communicate the methods

of their work to inexperienced officers, as though the science of successful prediction was a secret handicraft requiring initiation, and not the accurate discernment of peculiarly susceptible minds, which, by long experience and careful training, have become imbued with certain intricate meteorological knowledge. The basis on which rests their judgment is known to all scientific men, but their skill of correct judgment is in no manner communicable to others. It is no more possible for an indications officer of high standing to make another person a good indications officer than it is for a successful doctor to communicate to others his own great skill of diagnosing hidden diseases. The detailed records of this office show how necessary is experience for success in predicting, and it has always followed that after a considerable lapse of time in which no work has been done, an indications officer re-commences work less successfully and with a very reduced percentage. How essential practice is to success is shown by the comparison of the work years since, when officers continued steadily on this work, with the results of late years, when changes have been frequent and the course of work necessarily broken. The percentages for seven fiscal years have been: 1881, 86.9; 1882, 87.6; 1883, 89.1; 1884, 86.5; 1885, 84.4; 1886, 86.0; 1887, 80.9. The table of percentages shows that in such proportion as officers of long experience and high standing have been relieved from signal duty, to be replaced by those of less experience and training, just to that extent the character of the Service, as shown by the verifications, has decreased. If the country is to have the utmost benefit which can be derived from a bureau of this kind, it must be by ensuring that the officers who make these indications shall be men of training and experience, with a decidedly scientific bent of mind. Such a condition of affairs the Chief Signal Officer believes can only be obtained by reorganizing the Corps, and supplementing such reorganization by a system of temporary detail of selected officers of the Army, whence vacancies in the permanent officers of the Corps should be drawn by competitive examination from such candidates as would show the most decided aptitude for work of this character. It is no reflection upon the standing, scientific knowledge, or general ability of any officer that his success in work of this kind, demanding special aptitude and mental bent, should be only moderate. There are several officers in this Corps who give promise of success and future high standing in predicting and other important work, but there are others whose abilities are of such a quality that they can never be of marked value, but are on the contrary a detriment to the Service, and should be transferred elsewhere without prejudice to their standing or commissions. Doubtless their anomalous position, without hope for the future, has had its effect on some of these officers.

New and more rigid rules have been devised for determining the percentage of accuracy of the predictions, and the instructions governing the Indications Officer have been revised. In order that the public

may have the benefit of positive declarations, all ambiguous and doubtful terms have been forbidden, while others have been narrowed in their application. While these rules may possibly result in lowering the percentage of successful verification for the coming year, yet it is believed that the public interests will be better subserved by positive predictions devoid of ambiguity.

In connection with the subject of Indications, the Chief Signal Officer feels obliged to invite the attention of the Honorable Secretary of War to the necessity which exists for reports from the West Indies stations during the hurricane season, from the 15th of July to the last of October. The discontinuance several years since of these important stations, and the absence of meteorological reports south of Key West, has on more than one occasion misled the Indications Officer, and prevented timely and satisfactory warning of the Gulf ports against approaching hurricanes. Within the present season the advance of a hurricane which did great damage to shipping at Barbadoes, and was exceedingly severe in the centre of the Gulf of Mexico, could not be satisfactorily determined for lack of such reports outside of the United States, and so obliged this Service to send out general warnings for all the Gulf ports, instead of confining them to a particular portion of that sea. The first information of this cyclone came to this bureau from private sources—the Maritime Association of New York.

The appropriation of a moderate amount, say $1,500 annually, for the salaries of observers in Cuba and the Windward Islands, would result in material benefit to the maritime interests of the country. The Gulf and south Atlantic coasts are visited by few other storms than these violent hurricanes, which at times work so much devastation and injury, and such sections of the country should have the benefit of these reports.

The Chief Signal Officer has to acknowledge the courtesy, valuable advice, information, and assistance which Padre Benito Vines, S. J., of Havana, Cuba, has always extended to this Service in connection with the advance, passing, and prediction of hurricanes.

It is understood that the authorities on the various islands of the Antilles propose maintaining a series of meteorological observations in the interest of hurricane predictions, so that co-operation sufficient for all practical purposes could be obtained from these authorities for the moderate expenditure proposed.

STORM SIGNALS.

During the current year there have been 1,510 storm signals of all kinds ordered, of which 1,034, or 68.5 per cent., have been verified. This percentage is the lowest for years, and the causes therefor are those set forth in treating the subject of indications of this Service.

It should be known in this connection that the quality or bent of mind for the successful ordering of storm signals is slightly different

from that requisite for the mere forecasting of weather and temperature, so that great success in both classes of work is not always obtained. For successful ordering of storm signals, a naturally sound judgment and extended meteorological knowledge must be supplemented by long and varied experience. In no part of the work of this Service does theory need more to be reinforced by practice. The detailed table of signals forms Appendix No. 3.

That portion of the joint resolution of February 9, 1870, under which the Service was organized, which looked to the prediction of the force of storms, has never been attempted by this office. The Chief Signal Officer feels, however, that the difference in the force of storms is so great that the maritime public has the right to demand such service, and so has in view the early display of signals which will not only indicate whether the storm is to be light or severe, but also show whether winds are to come from a special quarter and—a matter at times of great importance—whether the storm-centre is approaching or has passed the station.

PACIFIC COAST WEATHER FORECASTS.

2d Lieutenant J. E. Maxfield, Signal Corps, Assistant, was in charge at San Francisco at the end of the year, having relieved 2d Lieutenant W. A. Glassford, Signal Corps, Assistant, on January 10, 1887. Lieutenant Maxfield's report forms Appendix No. 4.

Weather forecasts for the Pacific coast have been issued with regularity twice each day for the past fiscal year. These forecasts have been distributed in California and elsewhere on the Pacific coast through the agency of the Associated Press, and points not reached by the Associated Press have been warned by the Service in case of rain during the autumn and early winter, since the occurrence and extent of the first rains are matters of the utmost importance to the fruit and raisin growing districts of California. These warnings during the past year were instrumental in saving a large amount of fruit from injury, as evidenced by the many testimonials which have been submitted to the indications officer by the parties concerned.

The percentage of success in forecasting has been as follows: Weather, 84.1; wind, 72.0; temperature, 73.4; general, 78.5.

The display of signals has been continued with satisfactory results. While storms upon the Pacific coast are rare, yet they are at times severe, and coming, as they do, from the ocean, the difficulty of early warnings is materially increased. The injury to the cables in the Columbia River and at Tatoosh Island has materially interfered with the accuracy of storm warnings and predictions, since these cables reach points at which indications of coming storms are first reported, and from which reports are essential to make correct predictions.

Warnings for the storm of April 11, 1887, were sent to Port Angeles, Washington Territory, but this office had not been able to maintain

regular connection with Tatoosh Island for the display of signals, so that a ship put to sea in the face of, and in ignorance of the coming of this storm, whereby the vessel was lost. The restoration of the cable permits the early establishment of a station at that point.

In addition to the current work of indications, the officer in charge has collected and partly tabulated a large amount of meteorological data from voluntary stations on the Pacific coast. The distribution and changes of temperature as shown by these reports are valuable; but in California the distribution of rainfall is of special importance, particularly with reference to the different months of the year. Besides his other work, the officer on that coast has received and sent more than 1,100 communications, and has handled and discussed nearly 4,000 meteorological forms. The limited appropriations for rent, &c., of offices, has not permitted the Chief Signal Officer to furnish Lieutenant Maxfield with suitable furniture for his office, nor with proper messenger service.

Interest in current meteorology has steadily increased on the Pacific coast, and in cases where regular stations could not be opened, offers have been made by Mr. DeYoung, of the San Francisco *Chronicle*, to supplement the regular stations by others maintained at his private expense. In such cases this office has agreed to supply the instruments and pay for telegraphing the reports, leaving the private stations on the same footing as other voluntary stations, except that the data therefrom will be received daily by telegraph instead of monthly by mail.

COLD WAVES.

The system of cold-wave warnings has continued in successful operation, to the general satisfaction and frequently great advantage of the public, whose confidence has been justified by the large percentage of successful warnings. The general public are coming to understand the exact meaning of the term "cold wave," which implies that the temperature will fall below (45) forty-five degrees, and that in twenty-four hours an abnormal fall of fifteen, or more, degrees will occur. The important advantages which result from knowing sixteen to twenty-four hours in advance that the temperature will be lower by fifteen degrees or more, apply not only to agricultural, horticultural, and business interests, but also affect the personal comfort of thousands, and at times the health and life itself of hundreds. The importance of early and successful forecasts of cold waves is the greatest perhaps in the Great Northwest. In order to meet the needs of that section of the country, and to comply with the earnest applications from citizens and corporate bodies of great vested values, the Chief Signal Officer has under consideration the plan of stationing an indications officer at Saint Paul, Minnesota. This arrangement would enable that officer to receive his reports on an average of an hour earlier than in Wash-

ington, and would further enable him to send out warnings of cold waves in that section from two to five hours earlier than is now done. A warning earlier by two or three hours, while not of special importance east of the Mississippi River, is, however, to the country of the Northwest, where the earliest signs of a cold wave are rarely more than twelve to sixteen hours in advance of its full predominance. The stationing of an officer in the Northwest, who could make predictions for four or five states for the winter and spring months, would also relieve to a considerable extent the overtaxed indications officer of the central office. During the summer months the officer at Saint Paul would be available for inspection purposes, at a somewhat less expense than now, when his station is at Washington.

At the end of the year the number of Signal Service stations authorized to display cold-wave warnings was seventy-seven.

The number of cold-wave signals displayed during the year has been 541, of which 425, or 78.6 per cent., were verified; a gratifying result, though not as satisfactory as the Chief Signal Officer could wish, or as the public has a right to expect from this Service. Many other signals, not marked as successful, were followed by abnormal falls of temperature of from 10° to 14°.

WEATHER SIGNALS.

The weather forecasts prepared at 1 a. m., and running for twenty-four hours from 7 a. m. each day, have failed in many places to promptly reach the general public, owing to the necessity of local papers going to press before these indications can be received. In consequence this office has been strongly urged to disseminate generally its indications by telegraph. The Chief Signal Officer, on assuming charge, continued the service which was in vogue until the failure of the Deficiency Bill left the Bureau without means to longer continue it. Since the end of the fiscal year the Chief Signal Officer, while recognizing the necessity for liberal action, was unwilling to continue the former unsatisfactory arrangement. His alternate propositions have been met by liberal concessions on the part of the Western Union Telegraph Company that will enable this office to perfect arrangements which promise to give general satisfaction.

It is evident that the Government should not be put to the expense of displaying signals at every town or city throughout the United States, especially as the weather conditions are so generally made known through the metropolitan newspapers. In special cases, however, where private individuals or corporations are willing to make liberal expenditures necessary for the purchase of flags, and promise to regularly display weather signals for the common benefit, and where the associated press and newspapers fail to furnish the public with weather indications in reasonable time, the Chief Signal Officer has arranged to have the indications distributed at a nominal cost to the

Government. This distribution provides that the party interested shall make his own arrangement with the telegraph company for delivery, and that the Government shall be at no expense in any way for the display, and that the recipient shall also furnish this office with reports on the accuracy of the indications thus received.

It is probable that during the new fiscal year the number of such voluntary stations displaying weather signals for the benefit of the general public will reach between seven and eight hundred.

WEATHER CROP-BULLETIN.

The Chief Signal Officer has also instituted a new feature of the Service by issuing each Sunday morning a bulletin showing the effect of the weather, for the previous seven days, on important growing crops, especially corn, cotton, hay, tobacco, and wheat. From the many commendatory letters which have been received from interested parties, it is evident that these bulletins supply a long-felt want. An edition of two hundred copies was first issued, which has necessarily been increased, in response to demands from interested parties and corporations, to four hundred copies. The same policy has been pursued in the distribution of these bulletins as with other publications of the office; the Chief Signal Officer, desiring to supply the actual wants of the community as far as may be possible, has constantly impressed upon the observers the importance of restricting the gratuitous issue of bulletins or publications to such parties as desire them for practical or scientific purposes, and not for mere curiosity or transient interest.

In publishing the weather-crop bulletin the Chief Signal Officer has carefully refrained from trenching or interfering in any way with the field of work pursued by the Agricultural Department. An unsuccessful effort to obtain the co-operation of the Honorable Commissioner of Agriculture, in connection with this bulletin, was made, but that official did not think it was possible for him, under existing conditions, to furnish in advance information for consolidation with weather data. It is probable that such decision was better for the public interest; the question of acreage and actual condition are quite different subjects from excesses or deficiencies of temperature, sunshine, and precipitation.

In order to extend the usefulness of the bulletin for the coming year, the Commissioner of Agriculture has been asked to state, as far as may be possible, what conditions of temperature, moisture, rainfall, and sunshine are requisite to perfect the different staple crops in various parts of the country. Such information, when furnished, will be an excellent basis for the use of the general public, and, together with this system of weather bulletins showing the excess and deficiency of meteorological elements for short regular periods, must prove important factors in determining in advance the probable yield of the great staples of the country.

A careful study of such meteorological conditions, united with a knowledge of the character of the soil of various sections, would inevitably result in satisfactorily defining the limits within which any particular crop could be profitably cultivated. A sample copy of the Weather Crop Bulletin, with circulars and instructions relative thereto, will be found in Appendix No. 5.

SPECIAL BULLETIN.

Supplementary to the regular indications, special bulletins have been issued whenever the weather conditions in any section of the country demanded special notice. These bulletins gave warnings of approaching frost, severe and sudden falls of temperature, dangerous floods, and the probable movement of cyclonic and other dangerous storms. The special bulletin formerly issued on the first of the month, which gave the means of temperature, total percentage of rainfall, with other data, for the preceding month, was continued a part of the fiscal year, but has been discontinued, since the weekly publication of the weather crop-bulletin, mentioned elsewhere, has rendered the monthly publication unnecessary.

THE WEATHER REVIEW AND INTERNATIONAL BULLETIN.

The Weather Review and the Summary of International Meteorology have appeared monthly during the year. The publication of these reviews is necessary in connection with the current work of this Service, and, in addition to proving an economical method of presenting the data collated by this Service in a suitable form for study and reference in connection with the current work of predictions, has proved most valuable and interesting to meteorologists and others. About a thousand meteorological reports have been received and used monthly in connection with the United States Monthly Weather Review; while additional reports from three hundred and ninety-six land stations have been collated for the International Summary, together with reports from about 739 vessels. The Chief Signal Officer, realizing the impossibility of longer carrying out the promises made by his predecessor (General Myer) to international co-operating observers with reference to the publication of the simultaneous observations, agreed upon at the Vienna Meteorological Conference, decided to formally discontinue the collation and publication of these reports at the end of the present calendar year. While the reduction of the appropriation for printing and restrictive legislation has prevented, much to the regret of the Chief Signal Officer, this office from publishing, as in past years, the full data and daily chart of this valuable and unparalleled set of observations, yet it is gratifying to note that the hearty co-operation of foreign governments and individual observers has brought together such a valuable amount of synchronous data. In order that these observers, who have contributed so liberally of their time and means to

render this series a success, may profit by the ten years' observations, the Chief Signal Officer has decided to prepare (in addition to the monthly maps) the mean pressure, mean temperature, prevailing winds, and average storm-tracks on charts for each month of the year, which shall show the international ten-year normals for pressure, temperature, wind-direction, and storm-tracks. The preparation of these charts serves as a valuable study to the officers engaged on this work, and it is more than probable that the experience and study gained from an examination of the movements of the storm-tracks over the whole northern hemisphere, and the movements of the atmosphere from month to month, will be productive of beneficial results by better qualifying the indications officers for the work of this Service. It is only by discussions of the monthly means for prolonged periods of time, and over extensive areas of the earth's surface, that the world can hope to arrive at long-time predictions, and the appearance of these pressure charts will be looked forward to by the Chief Signal Officer with considerable interest, as strengthening or weakening the assumption put forth in the meteorological report of the Lady Franklin Bay Expedition, wherein the movements of high areas of pressure by months are shown to have a regular progressive movement over the whole northern hemisphere. In connection with the preparation of these charts, this office has been able to outline very clearly the limits of ice dangerous to navigation of trans-Atlantic vessels. The examination of these charts for a series of years permits the navigator to determine with considerable accuracy the approximate path of safety during the prevalence of icebergs and ice-fields. Another favorable result has been the discovery, by Sergeant Garriott, Signal Corps, that the dense fogs of Newfoundland, so vexatious and dangerous to all trans-Atlantic vessels, bear a definite relation to the storm-centres which pass from New England and the Saint Lawrence Valley eastward over the Atlantic Ocean. It now seems probable that the investigations which are being continued on this subject will soon result in this Service being able to predict, with very considerable accuracy, several days in advance, the coming of these fogs, so that steamships leaving American or European ports, being warned, may pass southward of the fog-belt and avoid delay and danger.

TORNADOES AND THUNDER-STORMS.

The Service has continued the work of collecting data relative to tornadoes and other violent local storms, for record and discussion, and a brief summary of the results of such study and investigations have appeared monthly in the Weather Review. Although there has been considerable pressure upon this office with a view to prediction of tornadoes, yet the Chief Signal Officer feels that neither the present condition of the science of meteorology nor the practical needs of the country would justify such forecasts. So almost infinitesimal is the

area covered by a line of tornado in comparison with the area of the state in which it occurs, that even could the Indications Officer say with absolute certainty that a tornado would occur in any particular state or even county, it is believed that the harm done by such a prediction would eventually be greater than that which results from the tornado itself. The Service goes as far as is deemed proper in predicting from time to time that conditions are favorable for severe local storms.

The question of thunder-storms has been so fully and thoroughly examined into by Professor Davis, Secretary of the New England Meteorological Society, who has enlisted the co-operation of several hundred voluntary observers in New England, that this Service feels that the investigations made by this able meteorologist are more full and complete than other pressing necessities of this Service permit to be done by this office. In consequence, since the publication of memoirs by officers of this Service cannot be made save by the direct order of Congress, it seems advisable to confine work in this direction to giving the New England Meteorological and other societies the heartiest and fullest co-operation in investigations of thunder-storms, sea-winds, and other important meteorological phenomena.

FARMERS' AND RAILWAY BULLETINS.

The only station which published the Farmers' Bulletin was discontinued, owing to the lack of appropriations and the failure of the deficiency bill on March 4th. Other means of reaching the agricultural population at a smaller expense decided the Chief Signal Officer to make the discontinuance of this station permanent.

The railway bulletin service has been decreased considerably during the year; its work being substantially replaced by the labors of the various state weather services and the plan of co-operation adopted by the Chief Signal Officer with reference to them. Several railways continue the service, however, and it proves in these cases, as before, a rapid and generally satisfactory means of disseminating the indications. This office continues to furnish indications and forms for displaying them to any railway which desires to co-operate with this Bureau. As the service is voluntary and unpaid, it is found often the case that operators neglect to post the bulletins with that regularity which the important character of the work calls far.

FOREIGN WEATHER SERVICES.

The Chief Signal Officer has faithfully carried out the arrangements authorized by the Honorable Secretary of War, which assured Professor Mascart, director of the Central Meteorological Office of Paris, that France and England should have the hearty co-operation of the United States Signal Service in the transmission of such weather dispatches as would benefit the meteorological services of those countries.

Through the gratuitous co-operation of shipmasters, this Service has been able to gain a fairly accurate knowledge of the weather conditions prevailing over the great storm region of the North Atlantic, and such data, in connection with the weather conditions of the United States, are cabled each night to Professor Mascart, at Paris. The cablegram contains the synchronous observations, storm gales, derelict wrecks, and dangerous ice noted for the previous five days by steamers arriving on the day in question. Not only is this information appreciated by the Meteorological Offices of Paris and London, but shipmasters of all nations express the greatest satisfaction at the successful efforts of this Service in bringing together and publishing promptly detailed information as to the existence and location of fog, ice-fields, and wrecks, since such information enables them to shape their westward course from England and France with greater safety. This information has, so far, been collected and telegraphed at the expense of the English and French governments; but in view of the hearty and generous co-operation which these nations have always extended in any scientific matters of interest or value to the United States, it is recommended that the attention of Congress be called to the propriety of making an appropriation for this service, which would scarcely amount to a thousand dollars a year. It must not be considered that this information is of value to foreign governments alone, since the forecasts based on these reports, made in London, are considered of sufficient importance and value to be telegraphed in full to the *New York Herald*, by which newspaper they are published for the benefit of mariners in general.

STATE WEATHER SERVICES.

Particular attention is invited to the careful and interesting report of 1st Lieutenant H. H. C. Dunwoody, 4th Artillery, Acting Signal Officer, which forms Appendix No. 5. Lieutenant Dunwoody's intelligent and unremitting attention to these services merits hearty commendation.

The Chief Signal Officer is gratified to report a marked progress, both in the efficiency and extent of the state weather services and co-operating meteorological societies of the country. In addition to the New England Meteorological Society, there are nineteen state weather services, of which there have been established during the present fiscal year New Jersey, Pennsylvania, North Carolina, South Carolina, Mississippi, Nevada, and Colorado, while the services of Michigan, Indiana, Kansas, and Nebraska have been reorganized. Efforts are also being made to organize co-operating services in California, New York, Oregon, and Wisconsin.

These state organizations play a most important part, not only in contributing a large amount of gratuitous data which beneficially supplements that of the national service, but also in supplying special data for their respective states. Some of them have also been most

useful to their different localities in promoting the rapid and extended distribution of the indications to such communities as otherwise would receive them too late for current practical benefit.

As Professor Cook, director of the New Jersey service, has said, these organizations will tend to improve the accuracy of local and national forecasts, will provide agriculturalists with extended and valuable local meteorological means, ensure that engineers be better informed as to the character and amount of benefits and injuries which may result from rainfall, and will inure to the benefit of physicians and their patients with respect to such diseases as are affected by meteorological conditions.

In addition to the practical advantages thus enumerated, may be added the benefit which the general service receives from investigations carried on by state weather services or meteorological societies, which result in improving the work of the national service. In this respect may be mentioned the work done and investigations undertaken through the intelligent direction of the New England Meteorological Society, the Iowa, Indiana, and Ohio services, and others. These organizations have attracted the attention and engaged the hearty co-operation of many intelligent observers, some of them gentlemen of leisure, whose pursuit of the study of meteorology must ultimately work benefit to these services, and by their stimulating influences contribute to the high character and standing of the national service.

The Chief Signal Officer has pursued, and will continue to pursue, towards these services the policy of a hearty co-operation, as far as the means of this Service and the tenor of legislation will permit.

The policy of strict non-interference with such organizations, unless requested by state authorities, has been followed; and further, the tendency of the Chief Signal Officer has been to discourage the multiplication of such organizations, where consodidation, as in New England, seems to answer better the purpose of the service, and at a less outlay. In this connection he does not believe the interests of the Government demand his interference with or criticism of the methods pursued by these societies, which in turn, from their local surroundings and circumscribed areas, cannot be fully aware of the difficulties which beset predictions on a grand scale, and of the embarrassments which must be felt by the chief of a service which has so many complicated and conflicting interests constantly demanding attention and consideration. The Chief Signal Officer looks upon these state services as a most valuable means of communication with the people of the country, through which he may learn the needs of the different communities with reference to, and in connection with agriculture, forestry, gardening, fruit raising, and other interests which are dependent either on normal climatic conditions, or are affected by rapid changes in meteorological conditions, and in turn receives from these

organizations valuable information and data which has redounded to the public benefit when utilized in the publication of the crop weather bulletin and other practical ways.

The observers detailed as assistants to the directors of the state weather services have, as a rule, performed their arduous and important duties most satisfactorily. It is to be regretted that the order of ability necessary for such responsible and exacting work is so meagerly compensated as is the case with these men.

RIVERS AND FLOODS.

The report of 2d Lieutenant F. W. Ellis, Signal Corps, upon the River and Flood Service, forms Appendix No. 6. This subject is also casually treated in the report of the officer in charge of Stations Divisions, which forms Appendix No. 7.

Three river stations have been closed, as being of minor importance, while fifteen other stations have been opened, at most of which new gauges have been built, and other necessary equipments have been furnished and placed in position. The failure of the appropriation for mileage prevented the Chief Signal Officer from putting an officer into the field at an earlier date, as he desired, and in consequence a few hundred dollars of the river appropriation, which was badly needed, lapsed necessarily, and must be turned into the Treasury.

At present sixty-nine special river stations, with paid civilian observers, are in operation.

The question of river observations, in relation to dangerous floods and the stages of navigation, has engaged the earnest attention of the Chief Signal Officer, who assigned 2d Lieutenant F. W. Ellis, Signal Corps, to a careful study of this problem. The unexpected and disastrous floods of the past few years have emphasized the importance of careful and systematic river observations, and have shown the necessity of river stations on all important tributaries of our great systems. It seems to the Chief Signal Officer that such a system of river and rainfall stations might be established as would enable a practiced indications officer to predict, with considerable certainty, the extent and continuance of any great flood many days in advance, so that timely warnings would afford ample opportunity for such precautions as would mitigate the severity of such disasters. The condition of the earth when any heavy rainfall occurs, the amount of precipitation itself, united to a knowledge of the average loss of water by evaporation and absorption, afford data of the greatest importance in such cases. With the view of improving this branch of the Service, all the important river gauges have been visited and placed in complete order, their zeros carefully redetermined, and every precaution taken to ensure the greatest possible accuracy of observations made therefrom.

As an important adjunct to the river observations, a system of rain-

fall stations has been arranged from July 1, 1887. These stations have been carefully located at suitable points in the great water-sheds of the country, near the sources of the principal tributaries of our large rivers. The observers at these stations are to be paid a nominal sum, ten cents, daily, for their reports, which will be mailed weekly to designated centres, and in case of heavy and excessive rainfall this information is to be forwarded, by telegraph, to a designated Signal Service station, in order that the information may be promptly disseminated throughout the section of country liable to be affected by the rainfall.

Owing to the failure of the deficiency bill, and a consequent reduction made necessary in telegraphic expenses, the river reports were for a time discontinued. When, however, the dangerous state of the lower Ohio and Mississippi rivers occurred shortly after, the numerous and urgent requests for the continuance of these reports made manifest their great importance to the inhabitants of these river valleys. The emergency was such that the Chief Signal Officer felt obliged to renew these reports until the floods subsided, although such course necessitated the discontinuance of other important work.

COTTON-REGION REPORTS.

The observations at special stations in the cotton-region were continued for six months, but, owing to the insufficiency of the appropriation, were begun the present summer one month later than usual. The Chief Signal Officer has been persistently urged to increase the number of these stations; a course which would doubtless result to the benefit of the cotton interests, but which is impracticable, owing to lack of money for the work. No further extension of this service is possible unless more liberal provision is made by Congress for these special observations. The amount allowed has been spent most economically, the remuneration paid to the observer being almost ridiculously small—twenty cents per day.

One hundred and thirty-two special cotton-region stations were in operation during the season.

DISPLAY STATIONS.

In addition to the regular stations for storm signals, now made at fifty points on the sea coast and great lakes, there are now in operation sixty-five special stations. Nine new display stations were opened during the early part of the fiscal year, but, owing to the failure of the deficiency bill, it became necessary later to discontinue thirteen special stations. The average cost of such display stations is about fifty dollars for the original outfit, exclusive of flag-staff.

The whole system of special display stations has been carefully examined and revised by the Chief Signal Officer, who finds that under the old system the cost of display of many of these signals was excessive. The plan of hiring an observer at a monthly salary has been discon-

tinued, and from the first of September every observer will be paid a certain amount for each signal displayed, the same principle being followed in this branch as in those of cotton-region, rainfall, and river observations, of paying according to the amount of service rendered.

The Stations Division at the end of the year was in charge of 2d Lieutenant F. R. Day, Signal Corps, who relieved 2d Lieutenant J. S. Powell, Signal Corps, November 15, 1886.

The energy displayed by Lieutenant Day in the management of this division under embarrassing circumstances, owing to the lack of funds, in addition to his extended knowledge of the personnel of the Service as well as of the separate stations, has contributed in no small degree to increased efficiency in this division of the office. Lieutenant Day's report forms Appendix No. 7.

The work in connection with the Stations Division has been greatly systematized and carefully revised, so that the duties devolving upon this division, which have greatly increased, have been performed with a diminished force. Among the improvements instituted may be mentioned the issue of maps and bulletins of the various stations by the cyclostyle process, a method well adapted for such purpose, and which has given greater satisfaction than any other duplicating device ever before used by the Service. At about thirty of the larger stations the morning tri-daily bulletins have been replaced by a cyclostyle weather map, which has been received with great favor by the business community, who consider this publication as presenting the data of this office in such a manner as to be easily understood and utilized by such business men of the country as have interests affected by weather conditions.

Another method of presenting data to the public has been adopted by the Chief Signal Officer, who has had calculated the normal temperature and precipitation for each day in the year for every station in the country, so that the public has been furnished, in connection with the daily mean temperature and precipitation, a statement showing the excess or deficiency of temperature and precipitation for the current day, and for periods since the beginning of the current month and current year. This information is now quite generally published, and for the first time farmers, merchants, and others interested in agriculture, or in seasonable weather, have data available from which to judge of the forwardness or lateness of the season, and thus to estimate the effect of the current weather upon the most important crops of the country.

The average amount of office expenses at each station of observation during the year has been $248.50; the different amounts ranging from $2.50 at Cairo, Illinois (where the station is in a Government building), to $1,253.27 at Chicago, Illinois. It should be added that this average amount is insufficient for the proper maintenance of stations, and that in many cases the condition of the furniture is not at all creditable to

the Service. To remedy the most pressing wants of proper furniture, the Chief Signal Officer will renew a deficiency estimate which was viewed with favor by the last, and which it is hoped will commend itself to the favor of the next, Congress.

Attention is invited to the fact that in a number of cities Government quarters are available in Government buildings, where it is evident that the economical interests of the Government would be subserved by quartering this Service; but in some instances the Service has been unable to avail itself of the privilege of these buildings, owing to the fact that the cost of moving is considerably larger than the rent for one or two years. In these instances, owing to the fact that the item for "Rents, &c.," is inadequate even to a proper maintenance of the present offices, it has been impracticable to move into the Government buildings. The Chief Signal Officer submits an estimate for a small amount to be used for this special purpose, since the final result would be a considerable saving to the Government.

Attention is invited to the fact that this inadequate appropriation of "Rents, &c.," was reduced on the 1st of July, 1883, the sum of $10,000 annually, and that since that date, the offices, then poorly supplied with furniture, matting, and other similar articles, which in the past four years have been worn out, are in a dilapidated condition. In 1884 this Service had one hundred and twenty-nine stations, for the expenses of which $40,000 was appropriated, but in 1887 the number has been increased eleven, while the appropriation has been reduced $10,000. The Chief Signal Officer has consequently increased slightly his estimate for this particular purpose for the coming year.

Attention is invited to the statement of the Stations Officer that the necessity of sending new men to stations, without having been trained in the various meteorological duties, has in instances impaired the efficiency of the work and caused frequent complaint. An earnest effort has been made on the part of the Chief Signal Officer to increase the high standing of the men of the Corps, and that a gradual progress has taken place in this direction is apparent from the prompt rendition of most meteorological reports, and the generally high standard of accuracy thereof.

INSPECTION OF STATIONS.

One hundred and twenty-eight meteorological and telegraph stations have been inspected during the year; sixty-five stations have not been inspected and have been visited by no officer of this Service for periods varying from twelve and a half to forty-five months. The lack of sufficient appropriation for mileage prevented the Chief Signal Officer carrying out what should be a sound rule of the Service, the inspection of every station at least once a year. It is beyond question that the continued efficiency by subalterns in any service depends, to a great extent, on personal attention being given by their superior officers to

methods and manners in vogue, and this is especially true of the Signal Service. The continued accuracy of the instruments at Signal Service stations can only be insured through comparison made by inspecting officers who are provided with sub-standards from the central office. Barometer errors are largely cumulative, and whenever these cumulative errors are not corrected through frequent comparisons, as is only possible by these inspections, such neglect results not only in largely increasing the work of this office in correcting the records subsequently, but is also liable to seriously affect the observations for current use, and thus lead the Indications Officer at a critical period into errors of prognostication, which may seriously affect the public.

While the observers on duty at the various stations are in general of excellent character and can be relied upon to correctly transact their business and properly deport themselves, yet a certain percentage of these men after trial and temptation succumb to their surroundings. It consequently results from time to time that men of the Service are led into such gross neglect of duty or such personal misconduct as reflects upon the reputation of this Service and impairs its efficiency. While it is impossible that any system should totally prevent misbehavior and neglect of duty, yet frequent inspections by regular officers of the Service is the most effective.

The Chief Signal Officer has steadily endeavored to supplement these annual inspections by monthly reports from the meteorological committees which have been appointed by various commercial bodies to act in co-operation with the Chief Signal Officer. While valuable reports and information are at times received from these gentlemen, yet, ingrossed as they are in their own important business affairs and uninformed as to the full tenor of the observers' duty, they are unable, even when desirous, to give more than a general expression of opinion as to the efficiency and standing of the observer. A list of co-operating committees will be found in the report of the officer in charge of the Correspondence Division (Appendix No. 8).

In addition to their labors in insuring the correctness of the station instruments and in ascertaining the degree of efficiency with which observers perform ther duties, the inspectors are ordered and required to confer at large stations with the meteorological committees and such other parties as, from their standing or their business connections, are especially interested in the Service. From such parties the inspectors invite suggestions with a view of increasing the usefulness of the Service, either by a wider circulation of the reports or by improvements in the methods followed. Inspectors are also required to report fully on the character and amount of data which shall be furnished by telegraph or mail to each station; their general instructions being to recommend only such information at each station as will surely be of value to the public in general, and to commercial, agricultural, and maritime interests in particular. This course is necessary since the

demands upon this Service for weather reports are so general and extensive, that not only is the sending to any station of reports, useless except for curiosity, calculated to diminish the value in which other reports are held at that station, but, through the expense of such reports, some other station is deprived from receiving useful meteorological information to which it is properly and justly entitled.

Since the discontinuance and prohibition of any school of instruction, another important and difficult duty is imposed upon the inspector, who not only carefully examines all observers and assistants as to a practical knowledge of their duties, and as to the progress which they have made in the theoretical knowledge of meteorology, but also inculcates in the observers that uniformity of method and manner which is so important in meteorological observations. Under the present conditions of the Service the Chief Signal Officer finds himself obliged to send assistants entirely ignorant of instruments and of all meteorological work to immediate duty at stations, and when, as sometimes occurs, the sergeant in charge is not a highly trained observer, whose method and manner of observation and recording are beyond ordinary criticism, the assistant is not properly trained.

The comparative frequency with which men neglect their duties, or misconduct themselves to the scandal of the Service, may be inferred from the fact that during the past year there has been discharged the Service for such causes over 2 per cent. of the entire force, which is probably about the average.

The Chief Signal Officer expresses his belief that, unless extraordinary circumstances prevent, with the present mileage appropriation he will be able to have every station in the United States, with perhaps one or two exceptions, inspected during the coming fiscal year.

UNITED STATES TELEGRAPH LINES.

The Telegraph Division has been under charge of the same officer as the Stations Division. The report of this division, made by 2d Lieutenant F. R. Day, Signal Corps, Assistant, in charge at the end of the fiscal year, forms Appendix No. 9.

The work of the Telegraph Division has involved the receipt of over a million and a half of cipher weather reports, and the receipt or transmission from the central office of seventy-five thousand service telegrams. The efficiency of this division is an important matter to this Bureau, and the proper and satisfactory transactions of the division, as during the past year, can only be obtained and maintained by the presence of careful and experienced men of long service. In addition to the receipt and sending of telegraph business, it is the duty of this division to audit the large and intricate telegraph bills of the various telegraph companies, a service which has been carefully and satisfactorily performed.

The sea-coast telegraph lines had thirteen offices in operation on

June 30, 1887, and the military telegraph lines thirty-six on the same date. $2,242.59 of receipts have been deposited in the Treasury from the sea-coast lines, and $5,827.96 as line receipts of the military-telegraph lines. In addition to these receipts, which aggregate $8,070.55, there should be credited to the lines the value of free business, which, if paid for, would have amounted to $8,685.54, making the total value of business done $16,756.09.

Military telegraph lines.

There were in operation at the beginning of the year 2,475 miles of military telegraph lines, and at the close of the year 2,022 miles, showing a net decrease of 453 miles. On the recommendation of the Chief Signal Officer, as being no longer necessary, 456 miles of line were abandoned and sold at public auction, and the proceeds turned into the Treasury. The only additional new line constructed during the year was a short extension of three miles, rendered necessary to connect Fort Robinson with a new railroad telegraph office at Crawford, Nebr. There is now under construction, out of old material collected from abandoned lines, a connection between Fort Du Chesne and Price Station, Utah, a distance of 87 miles. This work is being done by the labor of troops and without expense to this Service. Whenever a section of Government line has been abandoned and sold at public auction, it has been the rule to sell it on condition that if the purchaser maintains it as a working telegraph line, the United States may have the right of transmitting its business over such line at Government rates. It may be added that the Chief Signal Officer has followed the policy of abandoning and selling the military telegraph lines whenever the advance of railways or the extension of the general telegraph system affords the Government an opportunity of reaching military stations over a private wire. It is obvious that no private corporation would transfer messages by a circuitous route, and the maintenance of these duplicate lines would entail a considerable expense upon the Government, without any corresponding benefit therefrom.

The important services which these lines have rendered to the Army at large, while obvious to the General of the Army and division and department commanders, have hardly been insisted upon in past reports. Department commanders, almost without exception, have emphasized the importance, and in some cases the military necessity, of these lines. Every exertion is now being made to put them in the most efficient working order. The abandonment of a considerable portion of the lines enables the Chief Signal Officer to considerably reduce his estimates for this branch of the Service without in any way interfering with its future efficiency.

Sea-coast telegraph lines.

There have been many changes in the lines along the Atlantic coast during the past year. The cable and connecting land lines between Nantucket Island and the Massachusetts mainland by the way of Martha's Vineyard have been operated throughout the year without material interruption, and are now in excellent working order.

The cable between Nantucket and the mainland has been placed under the direct charge of an officer of this Service, who has been stationed at Wood's Holl, Massachusetts. The experience of this Bureau during previous years, in intrusting the management of extensive cables and a considerable number of telegraph offices to the charge of a sergeant of the Service, proved most unsatisfactory and resulted in great confusion and lack of efficiency, and gave rise to considerable complaint from the general public. 2d Lieutenant Julius H. Weber, Signal Corps, has been in charge of this section during this year, but his relief by 2d Lieutenant William D. Wright, Signal Corps, an officer of considerable experience in the management of telegraph lines, has been ordered.

This section of cables and land lines has proved of great importance, not only to the 40,000 sail which pass through the water-ways of Vineyard Sound and to the population of Nantucket and Vineyard Haven, but during the summer season to many thousands of visitors who make these islands their summer homes, and who, until these lines were established, were, in a measure, cut off from communication with their own homes. In addition to furnishing adequate telegraphic communication to thousands, and the display of cautionary signals for the benefit of passing vessels, this section has also been valuable as a means of communication between the light-house and life-saving stations on Nantucket Island and the telegraph office of the mainland.

The only additional sea-coast telegraph line constructed during the year was a submarine cable between Capes Charles and Henry and intervening land lines, which connect the eastern shore of Virginia directly with the rest of the state.

Believing in the policy of avoiding, as far as possible, the duplication of Government officials at the same points, the Chief Signal Officer during the year recommended the transfer to the Life-Saving Service of the sea-coast line between Cape Henlopen and Chincoteague, Virginia. This transfer commended itself to the Secretaries of Treasury and War, and was made at the end of the fiscal year. The great improvements in the construction of telephones permit the management by the employés of the Life-Saving Service of these lines along the Virginia and Delaware coast without the extra cost which was entailed upon the Government while these stations were also occupied for telegraphic purposes by the men of the Signal Corps. It is believed that the transfer will commend itself to the country at large as being

in the interest of economy, while by no means impairing the efficiency of the Service.

All telegraph lines and cables between Cape Hatteras and Wilmington have been definitely abandoned. The experience of this office for a series of years, resulting, as it did, in the expenditure of large sums of money without securing telegraph communication for any considerable period of time, convinced the Chief Signal Officer that a further expenditure of money and labor upon these lines would be by no means warranted. It is not known that the lines while in operation were ever of benefit, except to a few people along that immediate part of the coast, who derived considerable revenue from the repair of the lines and from the operators who were stationed thereon.

Recognizing the great importance placed upon the weather at Cape Hatteras by the vast commercial and maritime interests of the country, the Chief Signal Officer not only determined upon the retention of that important telegraphic and meteorological station, but also placed the sea-coast line from Hatteras to Norfolk in such a state of efficient repair that it can be relied upon substantially under all circumstances. The line is in first-class condition, and its working can only be interrupted through accidents incident to lines under best conditions or, perhaps temporarily, through the passage of a violent cyclone. In addition, the section between Wilmington and Southport (formerly Smithville), N. C., has been put in good condition.

Besides work on the sections named, the cable between Narragansett Pier and Block Island, Rhode Island, has been relaid and is in excellent working condition. The appropriation for this work was $23,350; the expense amounted to $16,192.13, and a balance of $2,357.87 will be turned into the Treasury; $4,800 having been already turned in.

On February 17, 1887, Congress enacted that a telegraph line should be constructed from Sanford, or the nearest railway point, to Jupiter Inlet, Florida. Owing to the mileage and transportation appropriations being exhausted, it was at first thought impracticable to commence operations on this line until July 1, 1887, but it was subsequently decided that, the appropriation being a specific one, all extraordinary charges involved in the construction of the line were proper charges against this appropriation. In consequence, 2d Lieutenant B. M. Purssell, Signal Corps, Assistant, was ordered to Titusville, and thence to Point Jupiter, Florida, in order to make careful reconnoissance of the line and report upon the route to be followed, and the methods which might be most economically pursued in the construction of this line. As a result it was decided to build the line by contract; the work to be done under the supervision of Lieutenant Purssell. It was most desirable, for many reasons, that the line should be completed by September 1st, in order that reports from Jupiter Inlet, which would be very valuable,

might be available during the coming hurricane season. Every effort was made to accomplish this end, but it was found impracticable, as no one could be found who would contract to complete the line before October 1st, and even then only with green timber. In view of the delay necessitated, even in using the most inferior timber, the Chief Signal Officer decided that it was better to delay the construction of the line six weeks or two months, especially in view of the fact that by so doing the best seasoned timber could be furnished for poles, and thus afford a stronger guarantee that when once completed the line would continue in good working order for a reasonable period of time. It is expected that the line from Titusville to Jupiter Inlet, Florida, a distance of one hundred and thirty-five miles, will be in operation by the 1st of December.

While appreciating the importance and value of this line, which connects the light-house and life-saving stations at or near Jupiter Inlet with the general telegraph system of the country, and renders possible the obtaining of regular meteorological reports from these outlying stations during the hurricane season, yet the Chief Signal Officer invites attention to the fact that the construction and maintenance of such lines is necessarily very costly to the United States, and that in the construction of further lines it should be had in view that the original cost conveys no idea of the future expenses. This line of one hundred and thirty-five miles in length will necessitate the services of at least six men for its proper care and management; in other words, the annual outlay for this telegraphic communication will not be far from five thousand dollars.

No additions have been made upon the Pacific coast to the sea coast lines, which, however, have been unserviceable for the greater part of the year, owing to a lack of proper appropriations to keep the cables in working order. The cable which connects Tatoosh Island with the mainland is of great importance to the maritime interests of the Pacific coast for reporting vessels. During the fiscal year ending June 30, 1886, over nine hundred and three vessels of all kinds were reported. The cable broke January 24, 1887, and remained unrepaired until June 25, 1887. The abandonment of a portion of the sea coast lines of North Carolina left possible a sufficient sum of money for the repair of this cable, which is now in good working order.

The Columbia River cable, connecting Astoria and Fort Canby, is said to be of great importance, not only for military purposes, as the Commanding General of the Department of the Columbia declares, but also, as the Maritime Exchange of San Francisco states, for the interest of commerce.

The condition of the Columbia River cable has been most unfortunate. It ceased working July 31, 1886, from causes unknown. Owing to the depth of sand which has accumulated over the cable it has been impossible, despite determined efforts, to underrun it. The assistance of

the Light-House Board was sought in order to raise the cable by the steamer "Manzanita," but although the board was willing to authorize the use of the steamer when it could be spared without detriment to that service, such time has not yet come. The office next sought the aid of the Corps of Engineers, as it was thought the cable could be raised for the sum at the disposal of the Chief Signal Officer, provided the use of certain of the Engineer plant could be obtained. Authority was obtained from the Secretary of War, but unfortunately the exigencies of the service did not permit the Engineer Corps to assist this Service by the loan of the machinery required. The office has been seriously embarrassed by the declared purpose of Congress that $500 only should be used for the repair of this cable. Since the Senate refused to increase this amount the Chief Signal Officer feels doubtful whether he could legally spend for this purpose more money than was specially named. As soon as it was definitely determined that no aid could be had from the Corps of Engineers, proposals for raising the cable were again invited, but none have been received.

Congress appropriated the sum of $2,500 for the purpose of building a line from San Francisco to Point Reyes, California. The appropriation amounted to but one-half of the original estimate, and it is doubtful whether the line can be built *via* Point San José. While the land line can be built from Point Reyes to a point on the Pacific Railway, thus ensuring reliable telegraphic communication between Point Reyes and San Francisco at a very small cost, it is doubtful whether the entire line could be built, since the wording of the law would certainly require a cable.

It has been suggested that one of the spare conductors of the Western Union cable between Fort Winfield Scott and Saucelito could be rented; but this is not practicable unless specially authorized by Congress, since the Treasury officials will not pass vouchers for the renting of other lines unless there is a specific appropriation for that purpose.

The Government system of cables in San Francisco harbor has been most expensive, and, so far, unsatisfactory. The cable between Point San José and Alcatraz Island has already cost this office nearly $3,800. It is almost four years since the cable was laid and it has been in operation less than one-half the time. Situated as the cable to Alcatraz Island is, in a line where strong currents prevail and where vessels frequently, by choice or necessity, anchor, it results that the chances of breakage are very seriously enhanced. The Chief Signal Officer is of the opinion that a cable cannot be economically maintained between Alcatraz Island and Fort Mason, even if a new cable should be laid between those points, and it is doubtful whether the old one would longer serve the purpose, since it has been broken and underrun three times. Proposals have been invited, however, for the repair and maintenance of this cable, which will soon be in working order.

THE CORRESPONDENCE DIVISION.

2d Lieutenant James Mitchell, Signal Corps, relieved 2d Lieutenant B. M. Purssell, Signal Corps, Assistant, August 4, 1886, in charge of the Correspondence Division, and yet remains on that duty.

Thirty-seven boards of trade, chambers of commerce, and other commercial organizations, have conferred with the Chief Signal Officer with reference to relations between this Service and the general public, a list of which is herewith appended.

Every effort has been made to reduce the methods of conducting the correspondence of the office to the simplest form, to the end that while due regard is paid to the proper record of public business, it may be transacted with the greatest possible speed and with the least clerical labor. The volume of correspondence is enormous, averaging over fourteen hundred communications each working day, and its transaction under old methods, where every letter was not only written by hand but also copied in the letter-book, would be impossible without a very great increase in the clerical force. Under present methods a large amount of the correspondence is transacted by short-hand notes, which are written out by the type-writer, and of which letter-press copies are made. Not only does this method present economical advantages, but the copy retained, being a fac-simile of the letter as signed, is free from those clerical errors which are inseparable from the slower method of copying by hand.

The current business of the office has been discharged with the usual dispatch, and, besides, considerable progress has been made in thoroughly indexing the war records of the Signal Corps. The organization, methods, and records of this division are now such that, as far as the division goes, all important letters can be answered the day of their receipt, and requests for information in pension and other claims can be, and are, reported on, as a rule, within forty-eight hours.

During the year there have been sent from this office, including all its divisions, 137,541 communications, and 297,852 communications received. 1,550,000 code words and weather reports, not included in the above, have been sent and received by telegraph.

During the fiscal year requests have been made for the establishment of thirty-four stations, as given in the attached list (Appendix No. 8). In general the stations requested have been for points adjacent to, or which are well covered by, existing stations. The Chief Signal Officer was unable to establish any stations during the year, but has made arrangements looking to the speedy opening of Fresno, Cal., Lexington, Ky., and Springfield, Mo.

THE INSTRUMENT DIVISION.

The Instrument Division supervises the exposure of instruments; the testing of barometers, thermometers, and other instruments; ob-

servations of atmospheric electricity with reference to meteorology; the study of new methods for self-registering instruments; observations of ground temperatures; the establishing and maintaining of standard instruments, and other miscellaneous observations of an experimental character.

The division was in charge of Prof. T. C. Mendenhall until October 30, 1886, when he was relieved by 1st Lieutenant Thomas M. Woodruff, 5th Infantry, Acting Signal Officer and Assistant, who remained in charge until June 1, 1887. The loss by voluntary and deprecated resignation of Professor Mendenhall was a serious one to the Service. It is much to be regretted that the Chief Signal Officer could not have given such assurances as to tenure and permanency of position as would have ensured to this Service for the future an official of such high order of scientific attainments and practical abilities as Professor Mendenhall is endowed with.

On the relief of Lieutenant Woodruff, 2d Lieutenant John C. Walshe, Signal Corps, Assistant, assumed charge; his report is Appendix No. 10. Junior Professor Thomas Russell has been specially charged with the inspection, comparison, and examination of thermometers and rain-gauges, while Junior Professor C. F. Marvin, has been charged with other scientific work in connection with electrical observations. The work of testing has been conducted by Professor Russell with such care and precision to insure accuracy as entitles him to much credit. Every thermometer is carefully tested at the freezing point of water, and for every ten degrees between that point and a temperature of 112°; below the freezing point of water it is tested for every twenty degrees to —28°. So rigid are the requirements of the Service that no thermometer whose error is greater than 0°.3 F. is accepted by this Service. 2,366 instruments of various kinds have been received, and 2,115 issued during the year. Professor Russell tested 1,281 thermometers for the Service, and 266 for voluntary observers; 272 rain-gauges were numbered and calibrated; 120 barometers were repaired, and 137 tubes filled during the year. In addition to the ordinary testing of instruments, the telegraph wire purchased for military field lines, or for use on the sea-coast, has also been tested.

In addition to the labor involved in the examination and testing of public instruments, 266 private instruments have been tested. In view of the great amount of labor and very considerable expense imposed upon this office by the purchase and testing of instruments for private parties, the Chief Signal Officer has felt obliged to discontinue such practice, save under special circumstances, when it is believed that such comparisons and tests will be in the interests of the public service, as in the case of directors of the state weather services, or of persons about to make special investigations.

During the year the Chief Signal Officer has designated barometer

Adie No. 1,526 as the standard of this Bureau, and has taken steps to ensure its continued accuracy. This is the first barometric standard that has been designated for the Service, though practically this barometer has been such for a number of years.

EXAMINER'S DIVISION.

The interests of the Service have necessitated certain changes in the Examiner's Division, which has been under the charge, at different times, of 2d Lieutenant Frank Greene, Signal Corps, Assistant; 1st Lieutenant R. E. Thompson, 6th Infantry, Acting Signal Officer; and 1st Lieutenant T. M. Woodruff, 5th Infantry, Acting Signal Officer and Assistant; the last named being in charge at the end of the fiscal year.

The work of this division, though very large, has been kept up to date as nearly as the nature of the money and property accounts which are examined therein would permit, except in the case of a few complicated telegraph accounts, which are a few months in arrears. The method of rendering the class of accounts in arrears has been somewhat simplified by the present Chief Signal Officer, and it is expected that the unexamined accounts will be soon brought up to date. The routine of this division was so elaborate and intricate that the former methods have been modified, under the belief that the large number of checks in vogue, while greatly increasing the work, complicating the adjustment of accounts, delaying payment to creditors, and obstructing public business, in no way subserved the public interests. Too many checks in the case of a disbursing officer serve no useful purpose, especially when, as in this Service, the money has already been paid, and the accounts are simply examined with a view to their technical correctness. The Chief Signal Officer, believing that care and attention should be given to these accounts preferably before the money is spent rather than afterwards, has increased his own personal work and direct responsibility by allowing no purchases or expenditures to be made which involve sums greater than fifty dollars without having been previously and personally authorized by him.

To simplify orders for expenditures, the fixed charges against the appropriation are now authorized at the beginning of the fiscal year by a special order, which gives in detail the purpose for which the money is to be applied, and limits the maximum amount, as far as possible, which is to be spent. In the case of weather reports, where the number of words cannot be positively fixed, a special order is issued which gives the maximum number of words and the rate allowed for each word over the different circuits for each month of the year. Whenever for any cause the number of words authorized is exceeded, the case is presented to the Chief Signal Officer for his personal action and orders. Under the new method the Chief Signal Officer is able to fix definitely against his Service the charges for three-fourths of the appropriations

at the beginning of the fiscal year. Such an arrangement also enables the chief to have a more thorough and intimate knowledge of his Service by permitting more care and attention to be given to the varying and indeterminate expenditures which go to make up the remainder of the appropriation.

The addition of the disbursements previously made by the Quartermaster's Department to the duties of the Disbursing Officer of this Corps necessarily entails extra work on that officer and also upon the Examiner's Division, which is thus obliged to pass upon novel and voluminous accounts. The arrangements and changes of methods will, however, enable this additional work to be performed without increasing the clerical force employed in the division.

A summary of the work performed forms Appendix No. 11.

BIBLIOGRAPHY OF METEOROLOGY.

The general bibliography of meteorology is nearly completed, the subject classification and author indexing having been finished during the year, in addition to the revision of the material on hand, and the collection of the new titles.

The next six months will close this work, making available for the use of this office a very complete card index of meteorological literature, including about fifty-five thousand titles, arranged by subjects in the most approved manner for reference, and with a full index of twelve thousand four hundred authors.

But the use of a manuscript catalogue, at best, is slow and laborious. There is a great need of a printed catalogue for constant use in this office, and provision should be made for its immediate publication.

In addition to this need of a printed work for office purposes, the value of a catalogue, not only to scientific meteorology, but to agriculture, commerce, engineering, and medicine, in making available the literature of applied meteorology, its relation to crop production, distribution of plants, forestry, river and ocean navigation, hydrology, protection against floods and destructive storms, medical climatology and epidemic diseases, renders its publication of great practical importance to this country and the world.

The preparation and compilation of this important work has been especially entrusted to Mr. C. J. Sawyer, who has been entirely responsible not only for the accuracy of the details but also for the general plan of the work and the methods employed. The classification of subjects has been completed and the cards are substantially arranged under their assigned subjects. Such classification is, to a certain degree, preliminary, and the lower sub-divisions (one hundred and sixty-nine in number) are necessarily experimental, and their final determination depends upon the number and character of the titles found under each subject. The titles used in this preparation were drawn, as far as possible, from the original works of libraries within convenient

reach, and, where access was not easy, correspondence was maintained for the explanation of doubtful titles. It is gratifying to note that many meteorologists, both of America and of other countries, willingly contributed most valuable information, especially in regard to the works of various meteorological services and observatories, the early series of which could seldom be determined without such aid.

The practical value of such a bibliography has been fully shown by its constant use in current office work, and, in addition to the official demands, almost daily calls for information have been received from parties not connected with the Service. The result of this work is the collection of special bibliographies, which ensures those consulting it a complete index of what has been accomplished in each special line of meteorology. As has been well said, the progress of meteorology is retarded, and labor therein wasted, owing to the impossibility of ascertaining what has been done in its various branches, an experience which, as scientific men well know, is by no means confined to this science. The cost of time and labor to the Government for the preparation of this work cannot be less than $12,000 to $15,000, and the result of these labors has been the completion of a work which is of great value, both practically and scientifically, to the entire world. The catalogue in its present condition is valuable and sufficient for the pressing needs of this Service; but to view it in this light would evince a narrow and selfish disposition, not in keeping with the scientific spirit of the age. At a cost of probably $8,000 or $10,000 this work can be printed and distributed to the world, as a monument and evidence of the growing scientific tendency of this nation. If such action is taken by Congress, the Chief Signal Officer has no doubt, from the willing spirit and hearty co-operation shown by leading scientists of other countries, that future international co-operation will secure, by a system of rotation, from the various European governments, the publication of a series of supplements, which will keep the world abreast of the steadily increasing volume of meteorological publications. The large number of American and foreign meteorologists and libraries have given largely of their time and energy in the compilation of this bibliography, as is shown by the fact that over one-half of the material has been contributed from foreign countries, so that the bibliography represents not only a large expenditure on the part of the United States, but also many years of additional gratuitous labor. The material could not be duplicated, and it would seem but a respectable reciprocity of exchange that the Government should print the catalogue, so as to enable the voluntary contributors to avail themselves of the complete work. This fulfillment of obligations to contributors by a public catalogue is an act of justice, but in addition it should be considered that this bibliography will be of great practical value to the agricultural, commercial, engineering, and medical interests not only of the United States, but of the world.

LIBRARY.

The library has been increased, by donation, exchanges, and purchases, five hundred and sixty-six volumes, and now contains 9,845 volumes; after deducting 1,261 books transferred to the War Department library, by the authority of the Honorable Secretary of War. The transfer of these books was recommended by the Chief Signal Officer in view of the fact that the very crowded condition of the library, owing to insufficient office room for this Service, rendered it impossible to care for these valuable books, many of which were being destroyed by dampness and mold. The library can never be properly preserved and cared for in its present surroundings, as it is now scattered in five different buildings, with no single room suitable to the purpose available. The Chief Signal Officer strictly confines all expenditures to the purchase of works and periodicals necessary to make it a working meteorological library, the present great value of which must largely increase from year to year.

RECORDS DIVISION.

A new division has been established during the year (on March 1, 1887), known as the Records Division, which has been mainly under the attentive charge of 2d Lieutenant J. P. Finley, Signal Corps. The necessity of this division was most earnest and pressing, and its establishment has resulted, even in this brief time, in a great economy of labor as well as proved a marked benefit to the public, who apply to this office for meteorological information. Under the old system, hundreds of volumes and thousands of forms were so badly arranged and so deficiently indexed as to render it a matter of great difficulty, and practically an impossibility, to obtain any consecutive data pertaining to the voluntary stations of the country.

Even if Congress does not later authorize the publication of the revised data in the shape of a climatological work for the United States, yet the orderly arrangement and proper indexing cannot but be true economy, as the demands made upon the office for meteorological data, either for use as evidence in courts or for scientific and other purposes, are yearly increasing. It has generally occurred in the past that the mere labor of finding records from which the abstracts were made involved far more time and effort than did the copying of the data asked for. The records of the office will speedily be in such condition that any given meteorological data can be referred to without loss of time.

At the end of the fiscal year, one hundred and sixty-five volumes, containing about fifty thousand monthly reports, have been rearranged and carefully indexed, so that the data of any station for any month can be instantly referred to. The re-arrangement, classification, and tabulation of the voluntary records will be carried on until they are as accessible and convenient for reference as are the observa-

tions of the regular stations, and strenuous efforts are being made, with considerable success, to fill gaps in long and valuable series. It seems most proper that the work of thousands of voluntary observers, who have given so freely of their time and interest, should be recognized by a proper compilation of the results, with a view to future publication.

Applications to this office for information are continually increasing, so that, except in special cases where the public interest demands further consideration, it has been necessary to restrict the gratuitous furnishing of information to such as may be possible in two hours' labor. Whenever the data requires more than that time, the applicant is given the option of obtaining it through the work of clerks outside of office hours, at the rate of forty cents per hour. Even with this restriction, on an average, one application daily is received, a considerable portion of which transcripts require certification under seal of the War Department, for use as testimony in courts of law. The office has been relieved greatly of labor entailed by the latter class of applications, through the permission granted by the Honorable Secretary of War, for observers of this Service to produce their records in court in cases where a certificate is filed by an attorney of standing, setting forth that the absence of such records would work injury to the interests of his client and subvert the ends of justice. The records, however, are only produced when such action can be taken by the observer without interfering with the duties imposed upon him by the War Department.

There have been during the year over 79 cases in which the records of this Corps have been used as evidence in court cases. In many other instances the records have been accepted as convincing evidence, which obviated recourse to litigation.

Appendix No. 12 is the general report of the officer in charge of the Records Division, and appendices Nos. 16 to 42 comprise such tables, compiled in the Records Division, as pertain to public business in connection with the Signal Corps and as are necessary in current work. These tables are valuable adjuncts to the preparation and study of forecasts and also greatly facilitate the work of the office in supplying valuable data, which otherwise could not be furnished, to hundreds who require it.

PUBLICATIONS.

Professor Abbe has been relieved by the present Chief Signal Officer from any routine work, so that he might apply himself to scientific research. In addition to a number of miscellaneous scientific reports he has especially applied himself to the completion of a treatise on meteorological instruments, which covers the subject of units, thermometry, barometry, anemometry, and pluviometry, and is designed to give considerable detail to all known sources of errors in the use of different

instruments, and to present the best obtainable knowledge bearing on points not well established. But little of the information contained in this work is to be anywhere found in text-books, and the high scientific standing of Professor Abbe guarantees the usefulness of the treatise, the result of his many years' study and research, to all who desire increased accuracy in the result of observations. It is hoped that legislation may be obtained from the coming Congress which will permit the publication of kindred treatises and similar professional papers. The preparation of treatises which involve the expenditure of thousands in the salary of the author ought certainly to be supplemented by an expenditure of hundreds, which would make them of continuing value to this service and the country at large. The Chief Signal Officer considers Professor Abbe's paper as bearing so directly upon the current work of the Service as to justify him in attaching it to his report as Appendix No. 43.

The Chief Signal Officer asks careful consideration of that clause of his estimates which looks to the publication of such original meteorological researches and memoirs, prepared by the assistants of the Signal Service, as bear on applied or scientific meteorology. Very valuable data is now useless and its publication not possible.

Junior Professor H. A. Hazen, in addition to much routine work of a scientific character, has been especially engaged in the preparation of tables of normal pressure and temperature for use by the Indications Officer and Review Division, and has been further charged with the care of the checking and reducing of all errors in station barometers and in elevations, which if neglected would work serious injury to the accuracy of the forecasts of the Service. He has also supervised the preparation for publication of the afternoon and midnight weather charts, and will soon prepare for work as Indications Officer.

THE PROPERTY AND DISBURSING DIVISION.

Captain F. B. Jones, Assistant Quartermaster, has remained on duty as Disbursing Officer of the Corps during the present fiscal year, and by his energetic and zealous administration has materially improved the conduct of affairs in his own division, and by his prudent course and accurate knowledge of administrative accounts has saved the Chief Signal Officer much care and anxiety. The detailed report made by Captain Jones forms Appendix No. 13.

APPROPRIATIONS.

The following shows the condition of the appropriations for this Service for the fiscal year ending June 30, 1887, with the expenditures, balances and probable demands, as required to be rendered by the Act of Congress approved May 1, 1820:

Appropriated:	
Observation and report of storms	$264,350 00
Maintenance and repair of military telegraph lines	24,000 00
Signal Service, U. S. Army	3,000 00
Expended:	
Observation and report of storms	182,170 12
Maintenance and repair of military telegraph lines	19,783 16
Signal Service, U. S. Army	1,945 83
Balances:	
Observation and report of storms	82,179 88
Maintenance and repair of military telegraph lines	4,216 84
Signal Service. U. S. Army	1,054 17
Probable demands:	
Observation and report of storms	73,141 11
Maintenance and repair of military telegraph lines	4,216 84
Signal Service, U. S. Army	1,054 17

There has been deposited in the Treasury the sum of $249.44 to the credit of the appropriation for observation and report of storms, which amount has been received from sales of maps and bulletins under section 227, Revised Statutes.

Especial personal attention has been given to the proper expenditure of the appropriations for this Service, and they have been administered, it is believed, with economy, and in accordance with the provisions of the laws.

In view of the inconvenience and grave results from the exhaustion of specific sub-appropriations, the Chief Signal Officer suggests that Congress authorize, with the specific approval of the Secretary of War, that 2 per cent. of the entire appropriations for the observation and report of storms be interchangeable. The fact that the exact amount of specific appropriations in certain cases cannot be accurately determined has been acknowledged regularly by Congress, in a proviso of this same character, in the appropriations for the Coast and Geodetic Survey in the same bill in which the appropriations for this Service are made. The amount interchangeable would but little exceed $4,000, and as the approval of the Secretary of War would be necessary, the interests of the public would be guarded, while the efficiency of the Service would be better maintained, The Chief Signal Officer has used every effort to re-organize the entire Service that its financial management and practical workings should conform to practices in vogue in large business establishments, and he believes that such interchangeability of appropriations within narrow limits are as much in the interests of economy as of efficiency.

Of the past year's appropriation, over $9,000 will be turned into the Treasury. In case a slight latitude had been allowed the Chief Signal Officer to transfer, with the approval of the Secretary of War, two per centum from one sub-appropriation to another, it would have resulted not only that the appropriation for last year could have been made several thousand dollars less, and thus avoided the appearance of an

unduly large appropriation, but the Service would have been saved much embarrassment, which resulted in detriment to public interests.

The system of rendering accounts of current telegraph receipts was modified on January 1, 1887, the changes being in the direction of simplicity, so as to render possible the settlement of such accounts within ten days after the close of the current month, instead of holding them for periods varying from four to twelve months, as occurred under the old system.

The Chief Signal Officer has reduced, as far as possible, the amount of work done in the carpenter and machine shops, believing that the force in these shops should be kept at a minimum. It seems proper that these shops should do only such experimental and repair work as the exigencies of the Service may require, or as from its trivial character would hardly warrant the expense of inviting proposals, but in all cases of extended work or manufacture the policy of doing such work by the lowest bidder after public advertisement will be pursued.

At the instance of the Disbursing Officer the Honorable Secretary of War was requested to authorize the absolute transfer of, and consequent responsibility for, all public property in the possession of the enlisted men of the Signal Corps, as is now done in the Ordnance Department. While the legal authorities of the Government realized fully the hardship and injustice of holding the Disbursing Officer responsible for the vast quantity of property, aggregating millions of dollars in value and scattered from Maine and Florida to Alaska and Arizona, and which the Disbursing Officer has never seen, yet it was decided that the power to transfer the responsibility was vested in Congress alone, and that special legislation would be necessary for such action. The present condition is analogous to a condition of affairs in which the disbursing clerk of the Postmaster General's Office would be responsible for all property at every post office in the United States. The Chief Signal Officer most strongly recommends that the attention of Congress be drawn to this unbusiness-like condition of affairs.

In the report of the Disbursing Officer (Appendix No. 13) will be found a list of contracts entered into during the fiscal year ending June 30, 1887, as required by the Act of Congress approved April 21, 1808. [Statutes-at-Large, Vol. 1, page 485.]

The Chief Signal Officer invites attention to the inadequate office and storage accommodations for this Service, and especially invites attention to the new structure, which has never been occupied, known as the "Fergusson Building," located on the corner of 24th and M streets, on square No. 25 (northeast quarter), the remainder of which is already owned by the Government. The bill for the purchase of this building was favorably reported at the last session of Congress, and it is evident that the purchase of this site, or some other one, would be a matter of economy for the Government. The 54,000 square feet of land, and the new building, which is valued at from $50,000 to

$60,000, can be purchased for the sum of $108,000, while the necessary store-houses and other out-buildings can be constructed for the additional sum of $42,000; so that the total and final cost of sufficient accommodations for this Service would amount to about $150,000, which at 3 per cent. interest would mean an annual rental of $4,500. The present rentals amount to $7,500, and about $500 is expended annually from the contingent fund for necessary repairs to the wretched and unsuitable buildings now occupied by this Bureau. To this sum of $8,000 should be added another thousand dollars for the excesses in cost of fuel, gas, heating stoves, etc., caused by the occupancy of eleven buildings, instead of one; and also $3,000 for extra laborers and messengers required, owing to the scattered offices of the Bureau; thus aggregating $12,000 against $4,500; a net annual saving of $7,500. Enough money has been paid for repairs and extra services, entailed by the present methods, since the organization of the Service to have purchased and completed the necessary buildings.

In touching upon this matter the Chief Signal Officer would be doing a great injustice to those serving under him if he did not call attention to the fact that the present crowded, unhealthy buildings not only materially reduce the amount of work done under such disadvantages, but also seriously impair the vital energies and undermine the physical health of the office force. Over one-half of the entire force has long worked on an amount of air averaging from one hundred and twenty-five to six hundred and fifty cubic feet, while sound medical authorities place the minimum air space compatible with health at seven hundred cubic feet. In this case economical considerations of money, time, and health happily unite to urge the quartering of this Bureau properly and adequately.

2d Lieutenant W. D. Wright, Signal Corps, remained on duty as Mustering Officer and assistant to the Property and Disbursing Officer in the examination and preparation for settlement of the pay accounts of the enlisted men of the Signal Corps during the fiscal year.

In connection with the pay of enlisted men, attention is drawn to the fact that under existing conditions the pay of the men of the Corps, although drawn from one appropriation, and that not a military one, is disbursed to the men by three different officers of three different corps of the Army. It consequently results that a greater part of the enlisted men, who on account of their small salary should be paid promptly, do not receive their pay until a date ranging from ten to twenty-five days after the end of the month for which it is due. In addition, it results that a very large amount of time monthly is lost to the Government by the payment on three different dates of the enlisted men serving in Washington.

Further, the payment of the men serving outside of Washington is not made direct to the men, but the checks are transmitted through this office to them, with the effect of duplicating the work of the Gov-

ernment, since the amount of clerical labor necessary to make the payment *de facto* entails upon this office nearly double the amount of labor which has already been performed by another department in making the payment *de jure*. If the Disbursing Officer of this Service could pay the commutation allowances for rations and the pay proper at the same time the payment for Quartermaster's allowances is made, it would not only save the drawing and recording of nearly ten thousand checks during the year, but would result in an economy of clerical labor to the Government of a value not less than five thousand dollars annually. Under the current system 16,920 separate payments are necessary for the 470 authorized men, which would be reduced by the proposed plan to 5,640 payments.

The question of suspended accounts has been carefully looked into by the Chief Signal Officer, who has expressed his desire of co-operating heartily and fully with the accounting officers of the Treasury in legally perfecting the disallowed vouchers, which aggregated, on the Chief Signal Officer assuming office, about $700,000. The accounting officers of the Treasury have likewise shown a disposition to modify their original requirements, which if carried out would have entailed on the different bureaus an extra amount of twenty thousand dollars' worth of clerical labor, and while no positive assurance has yet been received, it is believed that, where the spirit of the law has been strictly complied with, liberal interpretation will be given by the Comptroller regarding subvouchers substantiating the very voluminous telegraphic accounts of this Service.

In view of the large number of private persons, institutions of learning, &c., who purchased instruments through the medium of this office, in order that they might be sure of the accuracy of such instruments as compared with the Signal Service standard, the Chief Signal Officer has felt constrained to discontinue such practice, owing to the want of a special law authorizing the Signal Bureau to transact such business. These transactions have involved a very considerable expense upon this office, which the Chief Signal Officer deemed of questionable legality, and in addition have imposed a responsibility for private funds upon the Disbursing Officer, which should not justly fall upon this already over-burdened official. The propriety of this office guaranteeing the accuracy of private instruments seems unquestioned, and this office continues now, as before, willing to test and compare any private instruments sent to it. It seems, moreover, that institutions of learning, state officers, and others, should be able to obtain meteorological instruments of guaranteed accuracy, and it is suggested that Congress authorize the Chief Signal Officer to sell to institutions of learning, state weather services, voluntary observers, and such other class of individuals as may be thought, in the opinion of the Secretary of War, to subserve the public interest, standard meteorological instruments at the price paid for them by the Govern-

ment, and the moneys received from such sales be credited to the appropriation for observation and report of storms for the fiscal year in which such sales are made. It is believed that such legislation would indirectly advance the interest of meteorology, and redound eventually to the benefit of the country.

There have been purchased, for official use, 1,100 instruments of various kinds, and 3,105 have been issued during the fiscal year.

ESTIMATES.

The estimates of the Service for the fiscal year ending June 30, 1889, are $80,155.57 less than those for the current fiscal year. The re-arrangement of the work of the Service, the discontinuance of certain sections of telegraph lines, an improved weather code, and other changes in the direction of simplicity and economy, have enabled this considerable reduction. These decreases will in no way affect the efficiency of the present service, and they are based on the greatest number of stations which this Service is able to maintain under the limited sub-appropriation for rents and expenses which Congress has refused to increase. In case of increased stations, it will be necessary that the entire appropriation should be increased proportionately.

ORGANIZATION OF THE SIGNAL CORPS.

The necessity for a regular organization of the Signal Corps, with various grades, is too obvious to be dwelt upon, since officers and men of the high order of ability and intelligence required by this duty cannot be expected to devote the best years of their life to a service which offers no reward in way of increased rank or pay even for the most valuable work. Poor pay and no possible advance in rank must produce unsatisfactory results. During the past sixteen years selected line officers of the Army have devoted themselves to the interest of this Service, and no one who is familiar with the history of the Signal Corps is ignorant of the fact that the country owes much to these men, whose individual labors have built up and insured the success of the present Service. Only two of the original detail remain with the Corps, many having voluntarily quitted duty which promised no advancement, and some have gained promotion and reputation in other corps. The commission organized by the 48th Congress recognized in its report the importance of retaining permanently with the Corps officers of such long experience. It is only by long study and great experience that indications officers, who perform the vital work of this Service, can hope to be at all efficient in their important duties. An organization comprising, besides the Chief Signal Officer, one major, six captains, six first lieutenants, two professors, and two junior professors would be sufficient, provided the officers were competent for all duties. The grade of second lieutenant should not exist in a corps charged with such

important duties. A detail of six lieutenants, selected from officers who had served two years in the line of the Army, would insure material from which the Corps could be properly recruited by future competitive examinations. The proposed organization would leave the regular corps with fourteen officers against sixteen at present, and at practically the same expense. No officer should be promoted in this Corps without examination under conditions similar to those in force regarding the Corps of Engineers and the Ordnance and Medical Departments.

Regarding the enlisted men in Washington, it is obvious that some change should be made in the organization. An attempt to transfer this Bureau bodily to the Agricultural Department barely failed of becoming a law at the last session of Congress, and at that time the enlisted men of this Corps serving in Washington, almost without exception, exerted themselves in favor of a civil organization. While not much weight should be given to petitions of that character, circulated, as they are usually, by persons having some ulterior personal end in view, who too frequently obtain signatures by importunity or through fear, yet the Chief Signal Officer finds himself sharing in a measure some of the opinions put forth by the enlisted men serving in the main office. He believes that the interests of the Government, both in efficiency and economy, would be best subserved by the discharge from the Army of the purely clerical force in the City of Washington, and the organization of a civilian clerical force, such as now obtains in the offices of the Adjutant-General, Surgeon-General, Quartermaster-General, and elsewhere.

In such reorganization it would only seem proper and just that men thus discharged from the Signal Corps, who are familiar with its special work, should have preference for such civilian appointments, with the proviso and understanding, however, that such restrictions should be imposed as would bring the entire clerical force within the provisions of the civil service law.

This action would remove the sense of dissatisfaction which exists among many from being obliged to enlist as a soldier for a term of five years. It would also relieve the Chief Signal Officer from continued pressure, both personal and official, which is brought from time to time for the transfer of men from other sections of the country to Washington City. A civilian force in Washington would be more permanent than the changing military service, and the expense to which the Government is subjected for the transportation of these men would be considerably lessened.

The discharge of one hundred and twenty-five men serving at this office would permit the reduction of the Corps to three hundred and twenty-five enlisted men. The Chief Signal Officer is further of the opinion that the Corps could be economically reduced still another hundred, and that from the first of July, 1888, the Corps should be 125 sergeants (25 first class observers, for great cities, and 100 second

class observers), 50 corporals, and 50 privates. In such latter case the appropriations for pay and allowances of enlisted men could be reduced $100,000, and in lieu of such a sum should be appropriated $80,000 for the pay of civilian assistants. With such a proviso the assistants at observing stations throughout the country could be economically replaced by civilian assistants, as at many stations the work is such as to require the aid of an assistant only six months in the year. As a general rule, assistants can be hired at from forty to sixty dollars per month, where the expense to the Government now amounts to from fifty-five to seventy-five dollars, with an additional amount for expenses of transportation. In lieu of the present complicated and varying system of commutations for quarters, fuel, rations, and clothing, which also entails three distinct (monthly) payments from three different bureaus, it is recommended that there shall be granted to every man of the Signal Corps, not receiving allowances in kind, a fixed sum which shall be paid by the same officer as the pay proper. It should further be recognized that observers serving in great cities (those exceeding 100,000 by last census), or as assistant directors of state weather services, have more important positions, and that those serving west of the one hundredth meridian or south of the twenty-ninth parallel (in yellow fever districts) merit proper allowances, and to such the commutation should amount to $60 for food, quarters, fuel, and clothing, while to others an allowance of $50 would be reasonable. The average monthly allowances now somewhat exceed sixty-three dollars in Washington. There are now certain sections of the country, however, where the employment of civilian assistants would not prove satisfactory, and where only the restraints imposed by military service would insure meteorological duties being performed continuously. As a rule, to the southward of the twenty-ninth parallel, or the westward of the ninety-seventh meridian, the character of the climate and the social conditions which obtain are such as to prevent this office from being able to procure, at moderate and reasonable salaries, civilian assistants suitable for the work. It is probable that nearly 25 per cent. of the enlisted men who serve within the regions named would quit this Service if they were not held by their enlistment. The cost of living and the rates paid to laborers, even, are greater in these regions than those now allowed by the Government to men of this Service. In consequence, pecuniary temptations and other kindred causes often impel observers of this Service serving in such places to quit the Corps as soon as possible.

The law which authorizes two sergeants to be promoted each year to be second lieutenants should be continued, with the proviso that such promotions should be in the line of the Army and by competitive examination after not less than four years' service in this Corps. Such a law would properly recognize the services of such a highly trained and efficient body of men as form this Corps, and that such officers might not lose their early training, they could later, after some active service, and when specially fitted for this work, be promoted into the Corps.

In connection with the enlisted men, the attention of the Secretary is called to the fact that Congress for a number of years has failed to make any provision for the uniform of the Corps. In view of the fact that educated and intelligent men, such as almost exclusively form this Corps, object seriously to the showy uniform of the ordinary private of the Army, it is suggested that some neat uniform suited to the wants of the Service be adopted. It is obvious that men serving as officials of the Government should have a badge which would distinguish them to persons seeking official information; while, on the other hand, it is to be desired that the uniform to be worn should be so quiet and unobtrusive in its character as not to make its wearer too prominent a figure, or subject him to annoyance by its peculiarity or showiness. Both these conditions could be fulfilled with advantage to the soldier, to the community, and to the Service. The Chief Signal Officer has already made recommendations on this point.

I am, very respectfully, your obedient servant,

A. W. GREELY,
Chief Signal Officer.

LIST OF APPENDICES TO THE ANNUAL REPORT OF THE CHIEF SIGNAL OFFICER FOR THE YEAR 1887.

No. 1.—Military signaling division: report of, with inclosures.

2.—Indications division: report of, with inclosures showing percentage of verification of weather indications and cold-wave signals.

3.—Detailed statement showing number of storm signals ordered and verified.

4.—Pacific coast weather forecasts: report of.

5.—State weather service: report of, with inclosures.

6.—River and flood service: report of.

7.—Stations division: report of.

8.—Correspondence division: report of, with inclosures.

9.—Telegraph division: report of.

10.—Instrument division: report of.

11.—Examiner's division: report of.

12.—Records division: report of (general).

13.—Property and disbursing division: report of.

14.—Publications division: report of.

15.—Detailed statement of work performed by Prof. Cleveland Abbe, an assistant.

16.—Monthly and yearly meteorological summaries at stations of the Signal Service, U. S. Army, for the year 1886.

17.—Table of mean monthly temperatures, and departures of 1886 therefrom, in degrees (Fahrenheit), at stations of the Signal Service, U. S. Army. This normal has been computed from the commencement of observations at each station, to December, 1886, inclusive. The daily means are obtained by dividing the sum of the tri-daily observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.

NOTE.—Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time); and from January 1, 1885, to December 31, 1886, at 7 a. m., 3 and 11 p. m. (seventy-fifth meridian time.)

18.—Table showing the mean daily range of temperature, in degrees (Fahrenheit), at stations of the Signal Service, U. S. Army, for each month of the year 1886. The daily range is the difference between the highest and lowest temperatures as recorded by self-registering thermometers; the mean daily is obtained by dividing the sum of the daily by the number of days in the month.

19.—Table showing the mean maximum and mean minimum temperatures, in degrees (Fahrenheit), at stations of the Signal Service, U. S. Army, for each month of the year 1886. The monthly means are obtained by dividing the sum of the daily readings by the number of days in the month.

20.—Table showing the monthly and annual mean temperatures, in degrees (Fahrenheit), from reports made by voluntary observers of the Signal Service, U. S. Army, for the year ending December 31, 1886. The daily mean is generally obtained by dividing the sum of the 7 a. m., 2 and twice the 9 p. m. (local time) observations by 4; the monthly, by dividing the sum of the daily by the number of days in the month.

21.—Table showing the monthly maximum and minimum temperatures and annual range of temperature, in degrees (Fahrenheit), from reports made by voluntary observers of the Signal Service, U. S. Army, for the year ending December 31, 1886, from self-registering thermometers.

22.—Table showing the monthly and annual mean temperatures, in degrees (Fahrenheit), at military post hospitals for the year ending December 31, 1886. The daily mean is obtained by dividing the sum of the 7 a. m. 2 and twice the 9 p. m. (local time) observations by 4; the monthly, by dividing the sum of the daily by the number of days in the month.

23.—Table showing the monthly maximum and minimum temperatures and annual range of temperature, in degrees (Fahrenheit), at military post hospitals for the year ending December 31, 1886, from self-registering thermometers.

No. 24.—Table showing the mean of the maximum and minimum temperatures, in degrees (Fahrenheit), at the cotton-region stations of the Signal Service, U. S. Army, for the period from April to October, 1886, both inclusive. These means are obtained by dividing the sum of the daily readings of self-registering thermometers by the number of observations taken—one daily, at 5 p. m. (Central time).

25.—Table showing the mean a. m., p. m. and midnight temperatures, in degrees (Fahrenheit), at stations of the Signal Service, U. S. Army, for each month of the year, computed from the commencement of observations to December 1886, inclusive.

NOTE.—Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time); and from January 1, 1885, to December 31, 1886, at 7 a. m., 3 and 11 p. m. (seventy-fifth meridian time).

26.—Table showing the normal precipitation, in inches and hundredths, and departure of 1886 therefrom, at stations of the Signal Service, U. S. Army, for each month of the year. The normal has been computed from the commencement of observations to December, 1886, inclusive.

27.—Table showing the annual and mean annual precipitation, in inches and hundredths, at stations of the Signal Service, U. S. Army, compiled from the commencement of observations to December, 1886, inclusive.

28.—Table showing the monthly and annual precipitation, in inches and hundredths, from reports made by voluntary observers of the Signal Service, U. S. Army, for the year ending December 31, 1886.

29.—Table showing the monthly and annual precipitation, in inches and hundredths, at military post hospitals for the year ending December 31, 1886.

30.—Table showing the precipitation, in inches and hundredths, at the cotton-region stations of the Signal Service, U. S. Army, for the months from April to October, 1886, both inclusive.

31.—Table showing the mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year 1886.

32.—Table showing the date of the first killing frost and the number of days prior to this date that the first light frost occurred at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1886–'87.

33.—Table showing the date of the last killing frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1886–'87.

34.—Table showing the date of the first snowfall at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1886–'87.

35.—Table showing the dates of the last snowfall, at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1886–'87.

36.—Table showing the average hourly velocity of the wind, in miles, at stations of the Signal Service, U. S. Army, for each month and the year 1886. The average hourly velocity is obtained by dividing the total monthly movement by twenty-four times the number of days in the month.

37.—Table showing the maximum velocity of the wind, in miles per hour, at stations of the Signal Service, U. S. Army, for each month of the year 1886.

38.—Table showing the average cloudiness—scale of 0 to 10—at stations of the Signal Service, U. S. Army, for each month of the year 1886, computed from the tri-daily telegraphic observations. The monthly average is obtained by dividing the sums of the amount of cloudiness recorded daily by the number of observations taken.

39.—Table showing the number of clear, fair, and cloudy and rainy days at stations of the Signal Service, U. S. Army, for each month of the year 1886. Computed from the tri-daily telegraphic observations. Cloudiness is recorded on a scale of 0 to 10, each observation. Clear days comprise from 0 to 8 tenths; fair, 9 to 22; and cloudy, 23 to 30, inclusive; and rainy those on which .01 inch or more precipitation fell.

40.—Table showing the monthly maximum and minimum temperatures, in degrees (Fahrenheit), and the precipitation, in inches and hundredths, at third-order stations of the Signal Service, U. S. Army, for the year 1886.

41.—Table showing the mean maximum and mean minimum temperatures, in degrees (Fahrenheit), and the number of days on which .01 inch or more of precipitation fell, at third-order stations of the Signal Service, U. S. Army, for each month of the year 1886.

No. 42.—Tables showing the dates of closing and opening of navigation on the lakes and rivers at selected stations of the Signal Service, U. S. Army, for the winter of 1886–'87.

43.—Table showing the monthly and annual mean temperatures, in degrees (Fahrenheit), at stations on the Central Pacific and Southern Pacific Railroads and connecting branches for the year ending December 31, 1886. The daily mean is obtained by dividing the sum of the maximum and minimum temperatures by two; the monthly by dividing the sum of the daily by the number of days in the month.

44.—Table showing the monthly maximum and minimum temperatures and annual range of temperature, in degrees (Fahrenheit), at stations on the Central Pacific and Southern Pacific Railroads and connecting branches for the year ending December 31, 1886, from self-registering thermometers.

45.—Table showing the monthly and annual precipitation, in inches and hundredths, at stations on the Central Pacific and Southern Pacific Railroads and connecting branches for the year ending December 31, 1886 (copied from the records on file at the office of the chief engineer Central Pacific Railroad). Also, average monthly and seasonal precipitation in California, Oregon, Washington Territory, Nevada, Utah, Arizona, and New Mexico.

46.—Treatise on meteorological apparatus and methods, by Prof. Cleveland Abbe.

APPENDIX No. 1.

REPORT OF THE OFFICER IN CHARGE OF THE DIVISION OF MILITARY SIGNALING.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, July 30, 1887.

SIR: I have the honor to submit the following report of affairs pertaining to the military signaling division of the office for the year ending June 30, 1887.

The division was established June 18, 1885, and the duties of the officer in charge were made to comprehend the supervision of matters pertaining to military signals, including—

"The care and improvement of the field telegraph train, heliograph, knapsack telephone and telegraph, and signal apparatus in general; the preparation of a manual for instruction in military signaling and management of the field telegraph train; and the supervision of the theoretical and practical instruction in signaling of officers and enlisted men at Fort Myer and at this office, and the collation of all information possible from American and foreign sources in relation to the foregoing subjects."

The field telegraph train of to-day is practically that used during the late war. The battery wagon is of the ambulance type, light and strong, and fills all requirements quite as well perhaps as any vehicle yet devised. It is used for the transport of batteries, battery material, instruments, stationery, etc., and also serves as an office from which several telegraph lines may be operated.

The functions of the wire wagon (which is also of the ambulance order) are the carriage and distribution of the wire. It is equipped with a reel working on a vertical spindle, by means of which the feed of the wire in laying down is regulated, or the wire from a line taken up in coils. This wagon possesses no special merit, an army escort wagon with reel, would serve the purpose as well.

The lance truck with its equipment of poles is very cumbersome, and on soft or wet ground is as awkward to handle as a loaded six-mule wagon, and effectively disposes of the idea of celerity.

The train works well on good roads, but for field work under all conditions it will be necessary to reduce materially the number of poles to be carried on each truck, or to reduce the weight of the pole. Experiments in both directions have been made.

The train now remains housed at Fort Myer. Its value is too great, however, in a military point to warrant suspension of efforts towards improvement.

The telegraph train alone does not fill all conditions. The necessity for the establishment of earth connections implies a degree of fixedness as regards stations which is at variance with the idea of motion implied by the maneuver of contending armies.

In order to obtain freedom from the necessity for making a ground, recourse is had to an insulated double conductor used in connection with a portable field telephone or telegraph instrument.

This service has two designs for a field-telephone, the knapsack and the Eccard. The former consists of a canvas-covered frame carrying a reel upon which is wound half a mile of insulated double wire. A pair of trumpet telephones completes the equipment, which is disposed as a knapsack upon the shoulders of an orderly.

In operation the wire is reeled out as the orderly proceeds and left lying on the ground, provision being made in construction that its elasticity and tensile strength shall be sufficient to withstand the tramp of men, and the ordinary strains and friction to which liable. But at crossings of roads and at points liable to the passage of field-pieces or wagons it is necessary to cover the wire in shallow trenches or carry overhead through the trees.

The Eccard is in some respects an improvement on the knapsack pattern. It combines the telegraph instrument and telephone, the latter used as a receiver in both cases.

The employment of a portable battery in connection with this instrument is a feature wherein it falls short of the knapsack, which operates by induced currents; but the objection on account of acids will, it is hoped, be overcome by the use of a new regenerative dry element, and the instrument will then stand among the best of which this service has knowledge.

Hitherto it has been necessary to depend on the foreign market for the light, strong, pliable, insulated double conductor suitable for field work, but within the past few months a cable, equal in essential particulars to the foreign, has been produced in this country.

Visual signals supplement the use of the wire and become a necessity in situations wherein from any cause it is impracticable to run or maintain a telegraph line.

This service is provided with a variety of implements for conveying intelligence by such signals.

The flag represents the type of these, and the torch is its counterpart by night.

The former is of the old familiar pattern, the colors, dimensions, and design of the original used in the late war having been retained.

The advisability of dispensing with the largest size for general use, and of reducing the weight and length of staff, has been under consideration, and a flag kit devised as a substitute for the one now in use.

The extreme limit to which a signal by flag can be read with certainty falls so far short of the requirements for frontier signaling that the heliograph has rapidly come to the fore, and the demand for it has outstripped the present ability to supply.

The service has from time to time secured patterns of the most promising models, and several different kinds have been furnished the Army for practical test. There is a diversity of opinions as to relative merits, but it is clearly demonstrated that a more satisfactory instrument than either will result from a judicious combination of the best features of all.

Apart from the mechanical details of construction, the instruments are embraced under two distinct systems.

(1) That by which the direction of the flash is maintained constantly upon the distant station, the obscuration being effected by a screen.

(2) That by which the flash is made alternately to appear and disappear by change in the angle of inclination of the mirror.

Both systems require frequent adjustment to compensate for the apparent motion of the sun, but the greater merit seems to lie in the use of the screen, as by means of it signals can be transmitted without impairing the adjustment, whereas the reverse obtains in signaling by vibrations of the mirror, as the motion or jar imparted to the key operates directly upon the bearings of the mirror with a constant tendency to disarrangement.

The Grugan is most generally commended by officers, and in requisitions has the preference. It is effective within certain limits, but for extreme long range the demand is for more power and for better metal and greater nicety of finish in the screws upon which adjustment depends.

In determining the dimensions of mirror to be adopted, it is not alone sufficient to consider that the size of flash is independent of the size of the mirror, for, while this is approximately true as applied to the heliograph, account must also be taken of the fact that, since each unit of area throws off a cone of light, the brightness of the resultant flash must be directly dependent upon the number of such units in the mirror—that is, the larger the reflecting surface the greater the intensity of the flash, or power to overcome fog, haze, or distance.

Therefore, in proportion, as the necessity for work over long ranges increases, so should the size of the mirrors, due regard being had to the questions of bulk and transport.

The modification of the instrument as shown in the Purssell is an ingenious simplification of the original, but it is deemed a fatal defect that the mirrors should have been made so small.

The Begbie is an English instrument of the screen class, with no special feature to commend it beyond the size of mirrors employed. The screen, or more properly, shutter, is a clumsy contrivance in comparison with the pattern of this service.

The Mance is the standard instrument of the British service, and, notwithstanding the objections urged by the English officers themselves to the faulty principle of attaching the signaling key to the mirror, is based on the vibrating system.

In construction it is a much better piece of work than our Grugan, the careful workmanship reducing to small limits the tendency to disarrangement. The mirrors are admirable and so effective from their large size as to have created among our officers a strong feeling in favor of similar sizes for the frontier, where the conditions make practicable extremely long ranges.

The Garner is an adaptation of some features of the Mance, but can hardly be said to be an improvement on that instrument.

In the construction of a standard heliograph which shall embrace capacity for all work and satisfy the requirements imposed by our varied service, it has been found desirable that like parts be made interchangeable.

The torch is at present the mainstay in night signaling, but, on account of its comparatively short range (failing to supplement the heliograph), the necessity for the car-

riage of a large quantity of oil, which it consumes with such avidity, and its general uncleanliness, is not in good repute. On the other hand, a torch readily catches the eye from its motion, can be read with great certainty at moderate range, and is such a simple, primitive, natural device, and so readily improvised, that it is quite certain to be occasionally used in some form or other. Tests have therefore been made with a view to avoiding the objectionable features, and the new pattern submitted, which is provided with an asbestos instead of cotton wick and made self-feeding, is an outcome of such endeavor, but does not succeed in overcoming the difficulties.

Attention having been called to the fact that "brickwood" (a substance resulting from the action of heat on a mixture of clay and sawdust, the burning away of the sawdust rendering the baked clay exceedingly porous) possesses the property of taking up a large amount of oil and holding it without a drip or waste, and also that the substance will give off its oil freely when flame is applied, advantage has been taken of the knowledge to test the new material as a substitute for both the cylinder and wick of the torch, and the results are so satisfactory that it is probable, when the day comes that a flash lantern shall crowd the present torch out of the kit, a few pieces of brickwood, so arranged as to snap to the end of a stick, may still be retained as a handy torch for short range.

The flash lantern recommends itself at once as a means of avoiding the defective and unpleasant feature of the torch. It consumes little oil, is compact, simple and easy to operate, and it is hoped may be made effective at great range.

The present model operates with a key similar to that of the telegraph instrument, the arrangement for cut-off and display of light being excellent. It remains to be demonstrated whether a more powerful light may not be necessary. The one now used is produced by furnishing an artificial draft to a ⅝-inch wick, all the rays being projected forward by means of parabolic reflectors. These reflectors affect the power only as they serve to direct all the rays to the direction desired. Therefore, the intensity of the flash is directly proportioned to the candle power of the lamp or flame, without regard to the size of the reflector.

The incandescent lamp is not available at present for general signal purposes, the bulk and weight of the batteries affecting the question of portability too seriously.

The lime light is well thought of by the English, and is part of their equipment. It is obtained by causing a jet of oxygen to pass through the flame of a spirit lamp and impinge upon the end of a pencil of lime, by which the pencil is raised to a white heat. The result is an exceedingly brilliant light. The objection to its use is the necessity for the carriage of materials and vessels for the generation and manipulation of the gas.

Another device for a signal light contemplates the projection of a spray or jet of oil through the flame of a spirit lamp. The most surprising result follows such action, the spurt of flame jumping to the height of 2, 3, or more feet, in proportion to the energy of the jet, and making a most brilliant display visible at a great distance. The construction of an apparatus which shall make the use of such a flame practicable for field signals is under consideration.

The field glass with which the service is now supplied is of low magnifying power, but possessed of an extensive field. It is suitable for the purposes of an ordinary scout or reconnaissance, where a large section of country is to be taken in one field of view, or in readily locating the position of remote objects, but for the purpose of minute examination it is often necessary to bring to bear an instrument with much greater power than the field glass possesses, and this equipment is therefore supplemented by the telescope. The best of these instruments serve admirably for drawing near (apparently) and making distinct the details of a very distant object; but, unfortunately, the field of vision of the present model is extremely limited, so much so that in a fading light its value is much impaired. Then, too, the difficulty of maintaining the object in the field is such that the utmost care is necessary in finding and holding on.

The binocular telescope aims to combine the extensive field of the marine glass with the great power of the telescope, and, though falling somewhat short of either in its particular sphere, is an excellent substitute for both.

With the object of testing as to merit for use in our service, several of the most perfect of these instruments have been procured.

The smaller of these binoculars is fitted to a pouch to be slung from the shoulder in a manner similar to the method adopted in carrying the field-glass, and though somewhat heavier and half as long again, is yet portable.

Its light and field are nearly up to the standard marine-glass, and its power is as 26 to 30, compared with the service telescope; its great value for field purposes is, therefore, readily apparent.

The higher power binoculars, however, are of different pattern, and designed for use only at permanent stations. They do not admit of folding or "telescoping" to a small

compass, and are, therefore, awkward to handle in transporting, so that for general field use they are not favorably considered.

Rockets, signal bombs, colored lights, and minor signals have received but limited attention during the past year. Samples of various compositions for producing brilliant colored flames have been submitted, but the stock on hand of such material is ample, and can readily be replenished in case of need.

The subject of ballooning has also been in abeyance, but the service is kept informed as to the efforts of others, and the information on this head is accessible for ready reference in case of need.

The signal tower which has been so long held in position as a permanent station at Fort Myer has been taken down and packed for storage or shipment. Some minor repairs were found necessary.

The portable towers of the service are in the nature of extension ladders, mounted on light vehicles, and serve the purpose of making practicable the ascent to elevated stations in the field. The ladders themselves do not afford a very stable resting place for a signalman so long as the elevated end is in air, but in conjunction with some point of support well up, make a fair roost and observatory.

Homing pigeons.—In relation to the use of these birds for the speedy conveyance of military dispatches, the report of Major Upham reads:

"I was greatly surprised during my visit to Russia and Germany this summer (1886), by the importance attached by these nations to the carrier-pigeon service, having previously thought this interest was confined chiefly to France, Belgium, and the lower country.

"It was for this reason that, during the recent maneuvers of the Eighteenth Army Corps, to which I was assigned, I paid particular attention to the practical workings of this service, witnessing the manner of transporting the birds for field service, the method of attaching the messages and dispatching these couriers to their bases. This service was constantly made use of during the continuance of the maneuvers and always with complete success, and on the last day at Castleveil, during the progress of the final assault and just at the time of the surrender of the position, news of the disaster was transmitted by these carriers to Bordeaux, a distance of about 40 miles, in three-quarters of an hour, exhibiting an illustration of the modern method as now adopted by the great military powers of conveying rapid important intelligence when communication by railway and telegraph is cut.

"This service has grown up and been adopted by the different military nations since the last Franco-German war, when the great usefulness of the carrier pigeon during the siege of Paris became so well known and constituted for weeks a service of dispatches both public and private that the powerful and close line of circumvallation of the German army was powerless to prevent. It is reported that over 100,000 official, and about 1,000,000 private dispatches were transmitted in this way.

"The German and French Governments very soon commenced to perfect this service, and incorporated it into their military service, so that now, after fifteen years of careful breeding, training, and study of the habits of this bird, there are to be found in every local military center of Germany, and in every principal borough in France, pigeon-houses of blooded and well-trained birds, perfectly reliable for distances up to 200 miles, and selected birds for much greater distances."

The conditions which prevail in Europe are especially favorable for the perfection of the carrier service. Each capital and large city has always before it the possibility of environment by an enemy, and not only have the authorities, civil and military, given the subject attention, but the training and racing of the birds has become a fashion, as it were, and the interest is general.

Here the need for such letter-carriers is not so pronounced that it suggests itself as a necessity, but as it has appeared to many that useful results might be obtained on the plains, pigeons of approved stock were sent out to test the matter. The results of that endeavor are, however, not encouraging. Unfortunately the Territory (Montana) to which they were sent is infested by hawks, and attempts at giving the pigeons training flights were attended with such slaughter as to promise speedy annihilation of the flock.

A pigeon station has recently been ordered at Key West, from which it is reasonable to expect excellent results. Diligent inquiry has revealed that the conditions are very favorable, and the training of the birds for the flight from the seaward will receive special attention, that communication from a squadron in the vicinity of Havana or Nassau may be made practicable.

Instruction.—In previous years the jurisdiction of the Signal Office was extended or recognized to include Fort Myer as a part of the establishment of the office, and advantage was taken of the opportunity afforded by possession of this fine post to give all officers and men attached to the service a practical working knowledge of the various devices for

signaling, and to maintain in a state of proficiency a detachment of men who should be available at all times for field duty.

The act of Congress approved August 4, 1886, forbidding the application of public funds to the maintenance of such school of instruction, virtually dispossessed the service of the post, and the passage of the act was followed shortly by the transfer of officers and men to other stations.

During the year past, and because of lack of facilities, there has been no instruction whatever in that special branch which not only gave the service its name, but which was the primary cause of its existence.

On the other hand, at military posts there has been particular activity in this respect, as will be seen from the following statement:

Statement showing number of officers and enlisted men under instruction in military signaling in the various departments during each month of the year ending June 30, 1887.

Department of—	July.		August.		September.		October.		November.		December.	
	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.
The East	16	177	9	187	2	165	28	209	26	193	31	155
Dakota	11	122	6	91	6	90	7	95	5	68	4	80
The Platte	3	24	1	19	1	20	2	28	2	43	3	43
The Missouri	1	56	2	63	2	55	1	49	0	48	5	67
Texas	1	27	1	26	1	8	1	7	3	18	4	39
California	0	29	0	28	0	35	0	50	0	29	0	44
Arizona	1	30	2	44	2	32	1	69	0	72	1	80
Columbia	0	21	1	29	0	28	0	27	1	22	3	35
Total	33	486	22	487	14	433	40	534	37	493	51	543

Department of—	January.		February.		March.		April.		May.		June.	
	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.
The East	5	145	8	159	7	165	6	175	8	157	6	160
Dakota	7	89	5	75	8	83	7	106	4	108	10	127
The Platte	2	40	2	63	3	72	4	96	2	57	3	37
The Missouri	1	69	1	71	1	71	3	58	3	57	2	45
Texas	3	52	3	40	2	39	3	40	4	25	3	35
California	0	57	0	39	0	43	0	62	0	62	1	62
Arizona	2	63	2	83	1	96	4	106	3	96	*	*
Columbia	2	45	1	52	0	42	2	43	0	28	1	25
Total	22	560	22	582	22	611	29	686	24	590	26	491

* Reports not yet received.

The increased interest in signaling, as shown by this statement, is due to the impulse given by General Order No. 12, Adjutant-General's Office, 1886.

This order makes it incumbent on all officers and sufficiently intelligent men at the various posts throughout the Army to become proficient in the use of the flag, torch, and heliograph.

For practical purposes of the frontier, and during times of peace, there will, therefore, be plenty of well instructed officers and men available when communication by visual signals is desired; but the system of dependence on the Army for signalmen, however well it may operate in time of peace, is open to the objection that, as the Army makes a specialty of arms and not of signaling, in case of war this force would be naturally devoted to its legitimate work, and in lieu of an efficient body upon which to rely for exclusive attention to signals, there would arise, at the time of need, necessity for the creation and instruction of a new body out of new material.

Visual signals are, however, of but secondary importance. The electric telegraph (field train and light field and telephone lines) is the mainstay of all armies at the present day; but notwithstanding the importance attaching to it no opportunity is afforded to keep abreast of the times with the train, nor to drill, instruct, and make acquainted with its possibilities, even a detachment of men. The officers and many of the men of this service are well versed in their signal duties now, but unless some opportunity is given for practice by which this knowledge is to be retained, the moment of emergency, when field lines are to be laid rapidly and signals communicated promptly, will develop a most unfortunate state of affairs.

In view of the fact that the Chief Signal Officer is charged, under direction of the Secretary of War, "with the general signal service of the Army" and "with the equipment and management of field telegraphs used with active forces in the field," attention is especially invited to the conditions now existing.

Supply.—During the year 195 requisitions for signal equipments and stores and for supplies needed on target ranges were received, and action taken thereon.

Inclosure "A" shows in detail the articles furnished and their cost.

It will be seen that the total money value of these articles, $6,484.31, exceeds the amount of appropriation ($3,000), and this excess, $3,484.31, represents the cost of articles supplied from the stock on hand for contingencies.

For the incoming year the amount of appropriation is again $3,000. The needs of the Army for this year, as shown by reports received from military posts, are set forth in inclosure B. The money value of these articles, $13,559.24, is again much greater than the amount of the appropriation, and to fill the demand not only will the appropriation be inadequate, but the stock on hand will not avail to supply the deficiency. The item of heliographs alone will more than consume the whole appropriation.

In other years the amounts appropriated for signaling purposes have been as follows:

Year.	Amount.	Year.	Amount.
1861	$5,000	1875	$5,000
1862	55,950	1876	10,500
1863	115,891	1877	10,500
1864	100,000	1878	10,500
1865	100,000	1879	10,500
1869	5,000	1880	10,500
1870	5,000	1881	10,500
1871	5,000	1882	10,500
1872	5,000	1883	5,000
1873	12,500	1884	5,000
1874	12,500	1885	5,500

No appropriations for 1866, 1867, and 1868.

The great demand for signal supplies is due to the order for the Army to take up the subject of signaling, to the interest developed in the use of the heliograph by the success made of it in Arizona, and to the requirements on target ranges.

Miscellaneous.—Lieut. B. M. Purssell, Signal Corps, was relieved from charge of the division March 22, 1887.

The manual of signals prepared by this officer is still in manuscript form. The paper requires revision to make it correspond to the new code; in fact, it will not be practicable to perfect the manual till the composition of the standard equipment is definitely determined.

The work of the division, in addition to the attention given to experiment and supply, and the clerical work incidental thereto, has comprehended the collection of reports and data by which it is sought to keep constantly informed of the progress of European services. During the past year a number of such reports have been filed for ready reference under appropriate heads, and translations of many of these have been made by Sergeant Bunnemeyer, a most efficient and painstaking man.

In addition a scrap-book is made to do duty as a receptacle for various items of useful information having a bearing on the service, that are gathered from time to time. In connection with the collation of information it is desirable that a small fund be devoted exclusively to this end.

Very respectfully, your obedient servant,

R. E. THOMPSON,
First Lieutenant, Sixth Infantry, Acting Signal Officer,

The CHIEF SIGNAL OFFICER.

[Inclosure A.]

Statement showing issues to military posts during the year ending June 30, 1887, and value of same.

Articles.	No.	Value.	Articles.	No.	Value.
Telescopes and straps	25	$1,140.00	Cipher disks	57	$6.84
Telescope holders	21	5.25	Code cards	1,726	17.26
Marine glasses, cases, and			Wands	215	4.30
straps	57	527.25	Spools thread	8	.52
Telephones (rent per annum)	22	110.00	Needles	12	.05
Transmitters (rent per annum)	2	10.00	Wicking ... balls	300	5.70
Call boxes	16	224.00	Matches ... boxes	172	8.60
Anemometer	1	15.00	Pencils	104	4.16
Self-register for anemometer	1	27.50	Manuals of signals	27	13.50
Hygrometer	1	2.00	Wind shades	2	1.00
Instrument shelter	1	2.00	Oil ... gallons	169	25.35
Keys, telegraph	47	86.95	Seed for homing pigeons		
Sounders, telegraph	48	88.80	... pounds	150	11.00
Heliographs	48	1,680.00	Cutting pliers	6	9.42
Flash lanterns	8	600.00	Battery cells	86	120.40
Copper cans, 5-gallon	2	18.00	Sulphate of copper ... pounds	769	31.60
Eye-glasses, colored	6	1.08	Battery zincs	106	10.60
Canvas cases and straps	39	160.68	Battery coppers	44	2.20
Jointed staffs, complete	80	350.40	Sal ammoniac ... pounds	5	.40
Joints of staff	11	16.06	Galvanized iron wire ... miles	8¼	36.05
Flags, 4-foot	153	104.04	Office wire ... pounds	33.66	8.41
Flags, 2-foot	79	17.38	Insulators	329	12.34
Torches	88	211.20	Insulator brackets	328	3.67
Flameshades	86	25.80	Insulator knobs	25	.22
Extinguishers	84	25.20	Connectors	35	1.75
Canteens and straps	31	66.65	Spikes	100	.45
Haversacks	39	81.90	Double button switches	30	7.50
Funnels	46	8.28	Climbers and straps	1	.75
Pliers ... pairs	42	8.40	Prisms for battery ... pairs	2	.10
Scissors ... do	50	22.00			
Wormers	38	7.60	Total		$5,987.56

In addition to the above, 25 experimental sets of signal equipments, devised by Lieutenant Purssell, were distributed for further test, in compliance with directions contained in letter from Adjutant-General's Office, December 22, 1886, as follows: 3 to the Department of the Missouri, 3 to the Department of Texas, 3 to the Department of the Platte, 2 to the Department of Dakota, 2 to the Department of California, 2 to the Department of the Columbia, 3 to the Department of Arizona, 2 to the Department of the East, 1 to the Artillery School, Fort Monroe, Va.; 2 to the Infantry and Cavalry School, Fort Leavenworth, Kans.; 1 to the Military Academy, West Point, N.Y.; 1 to Willets Point, N. Y., costing $496.75; total value of equipments issued during year, $6,484.31.

[Inclosure B.]

Statement showing supplies needed at military posts for the year ending June 30, 1888, *and value of same.*

Articles.	No.	Value.	Articles.	No.	Value.
Telescopes and straps	22	$1,003.20	Matches ... boxes	221	$11.05
Telescope holders	13	3.25	Message pads or scratch-books	115	5.98
Marine glasses, cases, and straps	72	666.00	Pencils	117	4.68
Manuals of signals	59	29.50	Compasses	18	31.50
Copper cans, 5-gallon	3	27.00	Practice poles	8	1.50
Flags, 4-foot	152	103.36	Switch-board	1	.48
Flags, 2-foot	112	24.64	Lightning arresters	12	72.00
Flags, 6-foot	38	180.50	Wind vanes	6	23.70
Jointed staffs	51	223.38	Code cards	581	5.81
Canvas cases and straps	25	103.00	Hygrodeiks	2	4.00
Foot torches	25	45.00	Cross-arms	50	25.00
Foot extinguishers	21	6.30	Electric bells	2	5.00
Foot flame shades	20	6.00	Stop watch	1	15.40
Flying torches	24	72.00	Battery zincs	130	13.00
Flying extinguishers	23	6.90	Vises, hand	4	2.12
Flying flame shades	21	6.30	Cutting pliers	3	4.71
Wind shades	23	11.50	Needles	18	.07
Wormers	23	4.60	Battery coppers	100	5.00
Canteens and straps	21	45.15	Staples, assorted	144	.13
Haversacks	35	73.50	Sal ammoniac ... pounds	23	1.84
Funnels	21	3.78	Streamer flags	4	2.00
Pliers	19	3.80	Balls of tape	4	.76
Scissors	30	13.20	Magnet wire ... pounds	.50	.15
Cipher disks	21	2.52	Small straps	41	4.10
Heliographs	166	5,810.00	Battery boxes	2	1.00
Signal equipments, complete	52	1,033.24	Microphones (rent per annum)	2	10.00
Eye-glasses, colored	22	3.96	Letter clip boards	2	.36
Telphones (rent per annum)	139	695.00	Straps for marine glasses	2	1.00
Transmitters (rent per annum)	20	100.00	Torches, new style	6	10.80
Call-boxes	13	182.00	Mile kerite wire	1	171.60
Galvanized iron wire ... miles	33	135.96	Flash lanterns	3	225.00
Office wire ... pounds	152.11	38.03	Hand disks	4	.48
Cells, Le Clanche	34	59.50	Thread ... pounds	4	2.20
Cells, Eagle	66	92.40	Needle-cases	4	.40
Cells, Daniel	10	15.00	Cotton waste ... pounds	20	2.20
Insulators, glass	1,091	40.91	Odometers	2	6.00
Insulator brackets	878	9.82	Wind velocimeter	1	15.00
Insulators, porcelain	49	.43	Hinges for packing cases	4	.60
Barometers	6	168.00	Padlocks and keys	2	1.50
Anemometers	14	210.00	Ground plates	4	8.00
Self-register for anemometer	1	27.50	Box sounders	2	6.60
Hygrometers	2	4.00	Plug switches	5	8.75
Keys, telegraph	14	25.90	Signal shells	48	2.40
Sounders, telegraph	14	25.90	Packing cases	2	3.00
Relays	6	48.00	Lance sockets	2	1.00
Connectors	110	5.50	Lance straps	2	1.00
Poles, iron	256	1,226.24	Back boards	2	.20
Poles, wooden	135	135.00	Cords	2	.10
Wands	242	4.84	Wire holder	1	1.50
Wicking ... pounds	46.7	8.87			
Oil ... gallons	280	42.00			
Sulphate of copper ... pounds	610	25.07			
Spikes ... do	25	1.12	Total		13,559.24

APPENDIX No. 2.

REPORT OF THE INDICATIONS DIVISION.

OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington City, July 30, 1887.

SIR: I have the honor to submit herewith a report of the work done in this division for the year ending June 30, 1887.

The regular tri-daily indications for the thirty-nine separate States and districts at the 7 a. m. and 3 p. m. reports, and forty-one separate States and districts at the 10 p. m. report, have been prepared and issued throughout the year as usual, except that beginning April 1, 1887, predictions for twelve States only, and beginning April 5, 1887, predictions for eighteen States only have been made from the 3 p. m. reports, and beginning April 17, 1887, the detailed predictions by States have been omitted on Sunday morning, only a general prediction for the whole country being made at that report.

The regular twenty-four hour synopsis has been issued daily at the 7 a. m. report, except that during June, 1887, the Sunday morning issue was discontinued.

The regular issue of the 10 a. m. daily special bulletin was discontinued August 1, 1886, since which time it has been issued only when the conditions have indicated changes which should receive special mention.

The monthly special bulletin, issued on the first day of each month, containing a summary of the weather and temperature conditions for the preceding month, and when the month closes a season for the preceding season has been continued.

Tracings of the 7 a. m. isobars and isotherms have been furnished the publications division for use in the preparation of the daily weather map.

Storm warnings to the lakes, sea-coast, and Canadian stations, warnings of frosts to the sugar, fruit, cranberry, and tobacco districts, and warnings of cold waves, northers, and dangerous floods to the threatened districts have been issued whenever the conditions justified them.

The system of distributing indications by means of special messages to observers and others at central points to be by them distributed to other points in their localities has been continued during the year. At the beginning of the year seventy-three of these special messages were sent daily. These were continued with some few changes until March 4, 1887, when, owing to lack of appropriations, all messages sent at Government expense were discontinued. From that time up to June 8, 1887, about thirty messages were sent daily at the expense of the parties receiving them, and, beginning June 9, the messages have been again sent at Government expense. On June 30, 1887, there were forty-one of these messages being sent daily.

Special telegrams to individuals, giving the indications for certain specified localities and dates, have been sent whenever requested, at the applicant's expense.

On August 1, 1886, the number of charts prepared at each tri-daily report was reduced from seven to five, by consolidating Charts 2 and 3 (new No. 2), and Charts 4 and 5 (new No. 3). Charts 6 and 7 were renumbered 4 and 5 respectively. Some additional data were entered on Chart 6, and its designation changed from "Dew Points" to "Dew Points and Local Storms."

Beginning with July, 1886, the work of computing the monthly percentages of verifications of indications, cautionary and cold-wave signals, was transferred to this division. These percentages for the year ending June 30, 1887, will be found in the accompanying tables, marked A, B, and C, respectively.

Beginning August 1, 1886, the verification of indications and all signals was assigned to one officer of the indications board, to be detailed monthly.

The personnel of the indications board was changed July 20, 1886, by the addition of Lieutenants Greene, Purssell, Beall, Finley, Maxfield, and Day, announced as assistants to the Chief Signal Officer (G. O. 29, of 1886); March 1, 1887, by the restriction of its membership to those assistants who had had experience in the preparation of indications (Ins. 10, of 1887), thus relieving Lieutenants Purssell, Finley, and Day; and March 14, 1887, by the addition of Lieutenant Craig (S. O. 18, of 1887).

The work of preparing indications has been performed during the year by the following officers, viz: July, 1886, Lieutenant Woodruff; August, 1886, Lieutenant Maxfield; September, 1886, Lieutenant Greene; October, 1886, Lieutenant Maxfield; November, 1886, Lieutenant Greene; December, 1886, Lieutenant Walshe; January, 1887, Lieutenant Beall; February, 1887, Lieutenant Woodruff; March, 1887, Lieutenant Greene; April, 1887, Lieutenant Dunwoody; May, 1887, Lieutenant Craig; June, 1887, Lieutenant Beall.

The work of verifying indications and signals has been performed by the following officers, viz: July, 1886, indications board; August, 1886, Lieutenants Greene and Finley; September, 1886, Lieutenants Walshe and Maxfield; October, 1886, Lieutenant Greene; November, 1886, Lieutenant Maxfield; December, 1886, Lieutenant Greene; January, 1887, Lieutenant Greene; February, 1887, Lieutenant Beall; March, 1887, Lieutenant Woodruff; April, 1887, Lieutenant Craig; May, 1887, Lieutenants Greene and Finley; June, 1887, Lieutenant Craig.

The personnel of the clerical force of the division was changed as follows: July 26, 1886, Sergeant H. E. Williams, assigned; January 11, 1887, Sergeant James Kenealy, assigned; January 15, 1887, Private R. M. Geddings, relieved.

Very respectfully, your obedient servant,

JNO. P. FINLEY,
Second Lieutenant, Signal Corps, Assistant.

The CHIEF SIGNAL OFFICER,
Washington, D. C.

Percentages of indications verified for year ending June 30, 1887.

States.	1886.						1887.						Annual average.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
Maine	71.7	71.4	69.4	77.3	70.9	67.1	69.7	76.9	72.8	71.4	67.6	70.7	71.4
New Hampshire	71.8	71.8	69.0	77.1	72.7	69.5	70.4	72.5	74.4	70.6	68.2	70.3	71.5
Vermont	77.6	70.5	65.0	78.0	72.8	60.6	67.2	71.0	75.4	75.0	69.2	67.9	70.8
Massachusetts	71.6	71.4	66.4	76.8	72.4	67.5	70.3	75.1	74.9	76.8	69.3	71.4	72.0
Rhode Island	70.9	77.1	70.0	76.3	74.5	68.0	67.7	73.9	75.1	76.0	66.1	78.6	72.8
Connecticut	72.5	75.6	67.8	79.7	74.6	65.4	70.8	70.7	77.9	77.8	68.3	76.1	73.1
New York	75.7	77.3	73.1	81.4	80.2	72.8	72.7	....	....	....	....	....	76.2
Pennsylvania	69.7	80.0	71.5	80.2	76.2	69.8	73.2	....	....	....	....	....	72.9
New Jersey	73.3	81.2	72.6	81.2	80.6	70.9	77.6	76.2	75.3	80.6	67.6	77.0	76.2
Delaware	69.1	75.5	70.8	80.6	76.6	69.1	74.6	78.2	74.7	81.8	64.4	75.6	73.8
Maryland	71.0	79.3	74.4	81.8	76.8	73.4	76.5	77.6	74.5	78.6	67.8	76.9	75.7
District of Columbia	67.3	78.6	72.8	79.7	73.9	71.5	73.7	74.1	72.4	77.5	65.0	77.5	72.8
Virginia	70.4	75.7	71.7	81.0	76.4	72.7	73.6	75.5	74.1	77.6	69.6	79.5	74.8
North Carolina	70.9	75.7	75.1	88.2	82.4	74.3	78.3	72.0	79.0	80.2	68.3	76.0	75.9
South Carolina	69.8	73.3	76.2	85.5	77.5	72.8	78.2	69.4	77.5	79.2	68.3	75.7	75.3
Georgia	71.8	73.6	82.1	88.0	81.9	74.8	81.3	73.8	77.3	81.6	69.6	77.5	77.8
Florida	69.7	73.8	79.2	85.4	79.9	70.0	75.6	....	....	....	....	....	76.2
Alabama	70.0	75.2	81.4	87.6	75.9	66.7	76.5	74.8	75.6	81.9	66.8	76.8	75.8
Mississippi	70.6	72.9	77.8	84.8	72.2	65.6	72.0	71.2	75.7	84.7	67.9	72.4	74.0
Louisiana	76.2	78.4	78.8	86.0	76.3	65.9	72.0	70.2	76.3	86.3	70.8	72.8	75.8
Texas	74.5	86.5	76.9	88.8	82.3	64.8	73.7	66.7	74.8	88.4	76.1	80.6	77.8
Arkansas	70.5	73.6	75.6	84.3	72.5	63.8	74.2	67.1	77.4	79.3	63.0	69.7	72.6
Tennessee	70.0	66.9	76.2	84.8	67.6	65.0	75.0	69.8	72.4	78.0	63.4	70.7	71.6
Kentucky	76.8	71.2	72.9	85.8	70.2	67.0	74.1	74.1	74.4	76.2	72.1	78.0	74.4
Ohio	74.3	80.1	71.9	84.5	76.8	74.4	71.9	70.9	74.8	77.9	73.2	76.9	75.6
West Virginia	65.2	70.0	70.7	79.1	69.1	67.9	63.8	71.8	72.4	77.9	74.6	78.9	71.8
Indiana	75.4	75.7	73.5	84.9	73.7	71.9	74.2	74.8	76.4	75.5	72.1	77.6	75.5
Illinois	76.6	77.3	69.7	84.5	73.9	72.8	76.4	72.8	75.2	68.2	71.0	74.3	74.4
Michigan	75.5	82.0	71.3	83.1	76.1	72.0	75.2	....	....	....	....	....	76.5
Wisconsin	67.5	74.5	63.6	75.5	73.8	68.0	72.6	71.8	74.5	73.0	66.0	74.9	71.3
Minnesota	66.9	73.0	63.3	76.1	73.6	68.6	77.2	71.3	68.5	71.5	65.7	70.8	70.5
Iowa	70.7	71.5	62.9	74.2	76.6	68.7	75.6	75.7	72.8	73.1	69.8	77.0	72.4
Kansas	71.6	76.2	72.1	76.1	76.2	64.8	74.4	70.6	75.7	66.8	67.2	70.4	71.8
Nebraska	74.4	69.5	62.9	73.7	73.6	60.9	71.0	69.8	71.7	70.3	75.6	71.6	70.4
Missouri	78.0	76.2	75.4	82.4	75.6	73.6	79.3	74.2	72.1	64.4	66.8	71.5	74.0
Colorado	65.1	62.3	68.5	73.5	74.9	65.2	63.5	72.2	76.8	70.5	69.1	76.8	69.9
Eastern Dakota	68.0	66.3	61.4	72.0	73.5	57.8	68.8	65.0	64.0	71.1	70.2	66.5	67.0
Eastern New York	....	....	....	....	....	....	....	76.2	77.0	79.9	71.1	71.6	75.2
Western New York	....	....	....	....	....	....	....	78.8	73.0	77.1	69.3	71.0	73.8
Eastern Pennsylvania	....	....	....	....	....	....	....	73.9	75.7	78.7	67.1	74.0	73.9
Western Pennsylvania	....	....	....	....	....	....	....	75.8	69.9	76.3	71.2	74.6	73.6

Percentages of indications verified for year ending June 30, 1887—Continued.

States.	1886. July.	August.	September.	October.	November.	December.	1887. January.	February.	March.	April.	May.	June.	Annual average.
Eastern Florida	....	....	....	....	....	....	....	68.7	74.4	80.5	64.1	75.1	72.6
Western Florida	....	....	....	....	....	....	....	71.3	76.1	83.2	64.1	83.6	75.7
Eastern Michigan	....	....	....	....	....	....	....	73.6	74.4	78.3	73.5	72.2	74.4
Western Michigan	....	....	....	....	....	....	....	72.0	69.8	75.3	65.5	63.2	69.2
Weather	69.4	74.2	72.2	85.3	77.4	71.2	72.2	70.7	76.6	81.4	67.8	75.7	74.5
Wind	65.0	70.8	68.7	73.4	72.0	66.1	70.3	67.0	72.5	72.4	66.9	64.1	69.1
Temperature	76.9	77.9	75.4	78.8	73.4	66.5	76.2	76.7	72.0	74.4	69.8	75.4	74.4
Monthly average*	71.9	75.4	73.2	81.5	75.3	68.8	73.6	72.7	74.4	77.7	68.5	74.4	73.9

PACIFIC COAST.

States.	1886. July.	August.	September.	October.	November.	December.	1887. January.	February.	March.	April.	May.	June.	Annual average.
Southern California	89.0	84.2	92.1	77.3	86.0	82.2	84.6	82.2	84.9	75.8	83.9	90.0	84.4
Northern California	90.9	83.2	92.1	74.8	78.4	78.0	78.1	74.8	80.9	79.4	80.4	85.2	81.4
Oregon	84.1	82.4	84.7	70.4	68.1	68.2	78.1	64.8	71.4	63.5	74.1	76.4	82.2
Washington Territory	84.3	79.6	83.5	72.4	62.8	76.9	78.0	64.9	77.6	70.3	74.6	70.9	74.6
Weather	91.8	93.0	91.8	78.4	77.1	82.7	89.1	74.5	82.0	73.5	86.8	86.4	84.1
Wind	69.9	70.0	77.0	68.9	67.6	70.0	80.4	66.1	70.8	67.1	78.3	77.7	72.0
Temperature	85.4	72.1	82.9	69.1	73.8	70.0	67.9	69.6	76.5	72.0	67.5	74.2	73.4
Monthly average*	87.1	82.3	86.8	73.7	74.8	76.3	79.8	71.7	78.7	72.3	78.2	80.6	78.5

*The monthly average is obtained by multiplying the monthly percentage of weather by 5, wind by 1, and temperature by 4, and dividing the sum of the products by 10.

Statement showing percentages of verifications of cold-wave signals for the year ending June 30, 1887.

	Ordered.	Verified.	Per cent.		Ordered.	Verified.	Per cent.
1886.				February	258	189	73.26
July	....	....	....	March	133	107	80.45
August	....	....	....	April	83	70	84.34
September	22	15	68.18	May	20	17	85.00
October	93	56	60.22	June	....	....	....
November	242	193	79.75				
December	314	208	66.24	Total	541	425	78.56
1887.							
January	276	200	72.10				

APPENDIX No. 3.

DETAILED STATEMENT SHOWING NUMBER OF STORM SIGNALS ORDERED AND VERIFIED.

Percentages of verifications of storm signals for the year ending June 30, 1887.

	Cautionary.			On shore.			Northeast.					Southeast.				
								Verified.					Verified.			
	Ordered.	Verified.	Per cent.	Ordered.	Verified.	Per cent.	Ordered.	Both as to direction and velocity.	Per cent.	As to velocity only.	Per cent.	Ordered.	Both as to direction and velocity.	Per cent.	As to velocity only.	Per cent.
1886.																
July	0	0	0	0	0	0	11	3	27.27	3	27.27	4	0	0	2	50.00
August	31	9	29.03	0	0	0	7	4	57.14	1	14.28	0	0	0	0	0
September	98	31	31.63	5	4	80.00	0	0	0	0	0	0	0	0	0	0
October	77	43	55.84	15	11	73.33	3	0	0	0	0	0	0	0	0	0
November	23	14	60.87	1	1	100.00	36	24	66.67	7	19.44	60	40	66.67	9	15.00
December	24	9	37.50	0	0	0	37	17	45.95	0	0	0	0	0	0	0
1887.																
January	31	27	87.10	0	0	0	1	0	0	0	0	0	0	0	0	0
February	88	78	88.64	7	6	85.71	10	7	70.00	0	0	0	0	0	0	0
March	92	84	91.30	2	2	100.00	9	9	100.00	0	0	0	0	0	0	0
April	90	77	85.55	1	1	100.00	8	8	100.00	0	0	0	0	0	0	0
May	32	24	75.00	0	0	0	0	0	0	0	0	0	0	0	0	0
June	7	3	42.86	1	0	0	8	8	100.00	0	0	0	0	0	0	0
Total	593	399	67.29	32	25	78.12	130	80	61.54	11	8.46	64	40	62.5	11	17.19

	Southwest.					Northwest.					Total of all kinds ordered.	Fully verified both as to direction and velocity.	Per cent.	Ordered late.	Per cent.	Winds justifying cautionary signals, but for which signals were not ordered.	Winds justifying on-shore signals, but for which signals were not ordered.
		Verified.					Verified.										
	Ordered.	Both as to direction and velocity.	Per cent.	As to velocity only.	Per cent.	Ordered.	Both as to direction and velocity.	Per cent.	As to velocity only.	Per cent.							
1886.																	
July	8	2	25.00	0	0	4	0	0	0	0	27	5	18.52	0	0	26	27
August	0	0	0	0	0	0	0	0	0	0	38	13	34.21	0	0	21	11
September	21	10	47.62	12	57.14	23	7	30.44	0	0	147	52	35.51	0	0	25	28
October	12	3	25.00	0	0	8	5	62.50	1	12.50	115	62	53.91	4	3.50	21	15
November	68	61	89.71	4	5.88	118	82	69.49	6	5.08	306	222	72.55	4	1.31	42	21
December	20	1	5.00	1	5.00	90	61	67.78	3	3.33	171	88	51.46	4	2.34	39	12
1887.																	
January	21	20	95.24	0	0	99	86	86.87	0	0	152	133	87.50	18	11.84	41	4
February	0	0	0	0	0	102	78	76.47	7	6.86	207	169	81.64	17	8.21	28	1
March	0	0	0	0	0	70	52	74.29	1	1.43	173	147	84.97	6	3.47	21	7
April	0	0	0	0	0	27	22	81.48	0	0	126	108	85.71	13	10.32	25	4
May	0	0	0	0	0	0	0	0	0	0	32	24	75.00	1	3.00	26	28
June	0	0	0	0	0	0	0	0	0	0	16	11	68.75	0	0	26	26
Total	150	97	64.67	17	11.33	542	393	72.51	18	3.32	1,510	1,034	68.48	67	4.44	342	184

APPENDIX No. 4.

REPORT OF PACIFIC COAST WEATHER FORECASTS.

SIGNAL OFFICE, WAR DEPARTMENT,
San Francisco, Cal., July 12, 1887.

SIR: I have the honor to submit the following report of the work of the Pacific coast division for the year ending June 30, 1887:

Weather forecasts for Washington Territory, Oregon, northern California, and southern California have been issued twice daily, at noon and 8 p. m., and have been sent to the larger towns in these districts through the agency of the Associated Press. Whenever rain has been indicated, these bi-daily forecasts have been telegraphed to several points not reached by the Associated Press. During the autumn and early winter special warnings of the occurrence of rain were telegraphed to the fruit and raisin drying districts of southern and central California. These warnings were instrumental in saving a large amount of fruit from injury, and many testimonials to their accuracy and value were received.

Twenty-six cautionary signals were ordered during the year, of which number twenty were justified. The points at which signals are displayed are San Francisco and San Diego, Cal., stations at the mouth of the Columbia River, and Port Angeles and Seattle, Wash. Whenever signals have been ordered at Port Angeles, notification of this fact has been sent to posts on Puget Sound. Items from newspapers and letters received at this office show the value of these signals to shipping. The present service could be improved by making Port Townsend, Wash., and Eureka, Cal., stations for the display of cautionary signals. Port Townsend is itself a port of importance, and signals displayed there would be visible to all vessels passing out of Puget Sound into the straits. At present there is no display station between San Francisco and the mouth of the Columbia River, and as nearly all storms strike the coast north of Cape Mendocino, there is seldom occasion to order storm signals at San Francisco. Consequently, at present no special warning is given of storms occurring on the coast of northern California. Notice of such storms is given in the published indications, but these may not reach the persons most interested. A display of signals at Eureka would give the necessary warning. Owing to the failure of telegraphic communication no reports have been received from the stations at Tatoosh Island and Fort Canby during the greater part of the year. As these stations are on the immediate coast, and are the points at which indications of coming storms are first perceived, reports from them are indispensable to the intelligent ordering of storm signals.

An important part of the work of this division has been the collection and partial tabulation of meteorological data from stations other than those of the Signal Service.

Table I shows the number of meteorological forms received from various sources. The tabulation of the rainfall data from these forms has been kept up during the present year, and a valuable record thus maintained. A similar tabulation of temperature data was begun but could not be kept up owing to the limited clerical force available. The receipt of these forms has enabled this office to comply with the many requests from physicians, farmers, and others for rainfall and temperature data from districts not covered by the Signal Service stations.

A monthly weather review showing the meteorological conditions for each month along the Pacific coast has been issued, together with a table showing the rainfall at nearly one hundred stations. A weekly bulletin, showing the departures for the week from the normal temperature and rainfall at each Signal Service station, has been issued each Sunday morning.

Since taking charge of this division in January last I have given nearly all available time to study of the synoptic weather charts of past years with a view of increasing, if possible, the accuracy of the published forecasts. Study has also been given to the conditions under which frost occurs in California, and to the seasonal distribution of rainfall at stations west of the Rocky Mountains. Such study shows that the weather along the Pacific coast is greatly influenced by the meteorological conditions over the plateaus and mountain ranges to the East, and I would recommend that Prescott, Salt Lake City, and Helena be added to the list of stations sending tri-daily telegraphic reports to this office. Reports from these stations would be of great aid in determining the probable duration of winter storms, and also in the prediction of the local rains of summer.

Table II shows the working force of the division during the year. By this it will be seen that during the greater part of the time but one clerk has been on duty. On this

account much of the time of the officer in charge of the division has been taken up with clerical work which otherwise could have been profitably spent in study, and it has been found impossible to put all of the data received here into suitable shape for study and easy reference. The present force of two clerks, however, is amply sufficient.

This office is located, as in previous years, in the Western Union Telegraph Building, in the business center of the city.

Table III shows the expenses of the division during the year, exclusive of pay to the office force.

I am sir, very respectfully, your obedient servant,

J. E. MAXFIELD,
Second Lieutenant, Signal Corps, U. S. Army.

The CHIEF SIGNAL OFFICER,
Washington, D. C.

TABLE I.—*Letters sent and received, and meteorological forms received from Signal Service, voluntary, post surgeons, and railroad observers, and Light-House Department.*

Months.	Letters.		Meteorological forms.					
	Received.	Sent.	Signal Service.	Daily observations.	Southern Pacific Railroad Observers.	Post surgeons.	Light-House.	Postal Telegraph Company.
1886–'87.								
July	22	34	60	40	125	12	8	....
August	27	53	60	34	126	12	8	....
September	44	47	60	36	127	10	8	....
October	45	36	60	42	129	11	8	....
November	46	131	59	45	132	12	8	....
December	68	85	58	62	130	10	8	....
January	54	65	55	65	131	10	8	....
February	40	46	57	75	134	10	8	....
March	29	38	55	66	134	8	8	....
April	34	37	54	54	134	9	8	*216
May	26	40	54	39	132	10	8	*248
June	38	42	†48	†33	†118	11	8	*240
Total	473	654	680	629	1,552	125	96	704

* Eight reports received by telegraph each morning from the Postal Telegraph Company.
† Number received up to July 12, 1887.

TABLE II.—*Officers and enlisted men on duty at the Branch Signal Office from July* 1, 1886, *to June* 30, 1887.

Name.	Rank.	Dates.	Order.	Remarks.
Glassford, W. A.	2d lieut.	July 1, 1886, to Jan. 10, 1887	287, A. G. O., 1886	In charge.
Maxfield, J. E.*	2d lieut.	Jan. 10 to June 30, 1887	287, A. G. O., 1886	In charge.
Gorom, Nelson	Sergeant	July 1, 1886, to June 30, 1887	Letter, O. C. S. O., May 6, 1886.	Occasional clerical assistant.
Moore, Denis	Sergeant	Sept. 8 to Nov. 20, 1886	S. O. 97, Sig. Of., '86; S. O. 119, Sig. Of., '86	Clerical assistant.
Spriggs, J. C.	Private	Sept. 11 to Sept. 23, 1886	S. O. 69, Sig. Of., '86	Clerical assistant; discharged Sept. 23, 1886.
Wilkinson, H. E.*	Private	Oct. 13, 1886, to June 30, 1887	S. O. 98, Sig. Of., '86	Clerical assistant.
Boutcher, Geo. D.*	Private	June 10 to June 30, 1887	S. O. 44, Sig. Of., '86	Clerical assistant.
Riviere	Private	July 1 to Sept. 30, 1886	S. O. 9, Sig. Of., 1885	Clerical assistant; discharged Sept. 30, 1886.

NOTE.—Those marked with an asterisk (*) indicate the present office force.

TABLE III.—*Expenses of the Branch Signal Office during the year beginning July* 1, 1886, *and ending June* 30, 1887.

Nature of expense.	Amount.	Remarks.
Rent of office, at $20 per month	$240.00	
Rent of telephone, at $7.50 per month	45.00	From October 1, 1886, to March 30, 1887.
1 snatch-block	15.00	Shipped to Astoria, Oregon.
Janitor services, at $6 per month	60.00	From September 1, 1886, to June 30, 1887.
Washing towels, at 50 cents per month	6.00	
2 tons of coal, at $10.25	20.50	
Refilling of hektograph	1.75	
6 Argand chimneys	1.50	
Gas for office, at $2 per 1,000 cubic feet	15.40	
Total	405.15	

APPENDIX No. 5.

REPORT ON STATE WEATHER SERVICES.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, August 23, 1887.

SIR: I have the honor to submit my report of the operations of the State weather services and the meteorological societies co-operating with the Signal Service during the year ending June 30, 1887.

The services previously organized have continued in operation, and during the year new services have been established in New Jersey, Pennsylvania, North Carolina, South Carolina, Mississippi, Nevada, and Colorado, while the services in Michigan, Indiana, Kansas, and Nebraska have been reorganized. Efforts are now being made to organize these services in New York, Wisconsin, California, and Oregon.

The actual value of the State weather services to the people of the country and to the national service has been clearly demonstrated by the effective work of the past year. All the States where the services are in operation fully appreciate the benefits resulting therefrom, and several States have given the services a permanent organization under enactments passed by the legislatures, while the services in other States are at present almost wholly supported by the Signal Service, though all expect that speedy action will be taken by the States' authorities which will secure a permanent and independent organization, the chief object of these services being to afford facilities for the rapid and extended distribution of information collected by the Signal Service. The record of the past year shows that this object has been fully realized by the distribution of the daily indications, cold-wave warnings, etc., to more than twelve hundred stations which would not have received these warnings had the State services not been in operation.

The facility for the distribution of the Signal Service weather indications is only one of the numerous advantages resulting from such organizations. These advantages have been summarized by Prof. George H. Cook, director of the New Jersey weather service, as follows:

(1) It will be the means of soon securing better predictions of weather changes and storms.

(2) It will bring the benefits of the Signal Service of the United States into every county of New Jersey participating in the State local organization.

(3) It will soon prepare New Jersey for a system of storm signals displayed from railroad trains that will be widely beneficial to agricultural interests.

(4) It will give to every county the Government standards for temperature, rainfall, wind velocity, humidity, etc., which are sources of useful public information.

(5) It will put within reach of local agricultural societies means of accurate observations, which in the course of years must be valuable to any locality in the study and adaptation of cereals.

(6) It will bring the science and methods of the Signal Service within the reach of the high schools of the State, offering teachers and pupils alike excellent opportunity to study a wide range of the application of science to foster and protect agricultural industry.

(7) It will lead to the collection of rainfall statistics to enable engineers to better estimate the supply of canals, also the sudden downpours to guard against in laying out sewers in cities. It will lead to a correct knowledge of rainfall over different water-sheds of the State, for the purpose of giving data for supplying the water-works of cities, towns, and villages.

(8) It will lead to the forming of reliable meteorological records for use in legal cases.

(9) It will lead to a better practice of medicine, when physicians throughout the State can study diseases with reliable and accurate meteorological facts by their side, and for sanitary purposes correct meteorological statistics are invaluable to the practitioner in applying preventive remedies for the public good.

In addition to the above advantages, the Signal Service may receive substantial aid from investigations carried on by the State services or by meteorological societies which

may result in actual improvement of the work of the National Service. These organizations have attracted the attention of a large class of intelligent observers who are pursuing the study of meteorology, and are therefore better able to utilize the work of the National Service. These observers are also prepared to judge of the quality of the work issuing from that service, and, in my judgment, the ultimate effect will be not only to render the Signal Service more valuable to the people, but will increase the accuracy of the weather forecasts issued by the National Service.

Enlisted men of the Signal Service are now detailed as assistants to the directors of a number of the State weather services, thus securing the use of the department frank in the collection and distribution of data, thereby rendering substantial benefits to many services which were otherwise unable to provide the necessary blank forms, stationery, postage, etc., used in the work of these services, and the presence of these men at the State centers proves of special value to the National Service in the collection of data used in the preparation of the weekly crop bulletin during the present season. The directors of several of these services being connected with the agricultural departments in their respective States, enables them to collect by means of forms by the Chief Signal Officer, reliable information as to the probable effect of the weather upon the growing crops, and these reports, after being collected at the State centers, were summarized and telegraphed to this office to be used in connection with weekly and seasonal charts and the preparation of the bulletin.

I inclose herewith a detailed report from the director of each of the State services, showing the work performed and the condition of the services at the close of the fiscal year; also copies of the bills passed by the legislatures of Pennsylvania, Michigan, and Nevada, relative to the organization of weather services in those States. I would recommend that an effort be made to complete the organization of the services in Louisiana, Wisconsin, California, and Kentucky, as sugar, tobacco, and fruit interests of the country would thereby receive substantial benefits.

After the detail of Signal Service men as assistants to the directors of State weather services, the co-operation of railroads was solicited with a view to distributing the weather forecasts throughout the States economically, and, almost without exception, the railway corporations were desirous of availing themselves of this means of benefiting the public. Inclosure No. XXII shows the railroads, and the stations of each receiving and transmitting the indications before March 4, 1887. The use of railway telegraph lines for this purpose was claimed by the Western Union Telegraph Company as an infringement of the contract made by many of the railroad companies for the operation of telegraph lines. The method of distribution was as follows: The indications were telegraphed from the office of the Chief Signal Officer to the State centers, and the assistant at the State center was authorized to furnish copies of this dispatch to each railroad company co-operating, and the railroad company finally transmitting the dispatch over its line permitting each station operator to copy the same for the benefit of the people. The failure of the deficiency bill, leaving the Signal Service without the necessary funds, caused the discontinuance of the dispatches to the State centers from this office after the 5th of March, and the work of telegraphing was not resumed until the latter part of June, when it was resumed under more restricted terms which had been secured from the Western Union Telegraph Company, under which the dispatch to each station receiving the weather forecasts shall be paid for by the Signal Service at a greatly reduced rate. It is believed that this method of distribution will prove a great benefit to the service, but the experience of two months during which it has been in operation leads me to believe that a more prompt delivery of the weather forecasts could be secured by directing the Signal Service assistant of each State service to deliver to the railroad officials the dispatches for transmission over their lines.

In conclusion, I wish to commend the Signal Service assistants who have been detailed for work in connection with these services. These men have uniformly performed their duties with fidelity and intelligence, and as the nature of their work requires frequent change of station, thereby entailing additional expense, I respectfully recommend that their pay and allowances be made the the same as that received by men of like grade at the central office.

Very respectfully, your obedient servant,

H. H. C. DUNWOODY,
First Lieutenant, Fourth Artillery, A. S. O. and Assistant.

The CHIEF SIGNAL OFFICER,
Washington, D. C.

[Inclosure I.]

PENNSYLVANIA STATE WEATHER SERVICE.

PHILADELPHIA, *July* 7, 1887.

SIR: In reply to your letter of June 15, relative to the work of the Pennsylvania State weather service during the year ending June 30, 1887, I have the honor to report that the delay in getting an appropriation, followed by another delay in getting instruments, has given this State more of a prospective service than one which can show results. Everything done thus far has been with a view of securing a service for the State which will be, when fully organized, one of a high order.

An appropriation of $3,000 has been secured, and twenty-five full sets of instruments, consisting of maximum and minimum thermometers, hygrometers, rain-gauges, and instrument shelters, ten mercurial barometers, and one hundred sets of weather flags have been ordered and will be ready in a few days, when they will be distributed at the various points selected. It is the intention to have one recording station of observation in each county. These records will be published monthly in tabular form. Each station will be supplied with standard instruments, and the necessary action will be taken to have them properly exposed. Several of the professors of the various colleges in the State will act as observers, and as many of them are already supplied with the necessary appliances for the work, expenses for the counties they will represent will be small. In addition to the regular work, some of them have stated that they will make electrical and other observations. Judging from the interest manifested by them, good and reliable data will be secured. Through correspondence quite a number have been reporting, but a lack of instruments prevented them from making full reports, and a personal examination of their instruments and the manner of exposure established the fact that most of their observations were unreliable.

Some "display stations" have been established. A strong effort is being made to have the larger towns appropriate a sum sufficient to purchase the necessary weather flags and have them displayed from their public buildings and parks. This plan seems to meet with favor. In almost every county there are organized "agricultural societies" and a circular letter is being prepared, asking them to organize a system for duplicating the displays all over their counties. By their aid, together with that of the towns and the assistance promised by the railroad companies, it is hoped that in a short time the forecasts and warnings of the Signal Service will be well disseminated each day in all parts of the State. Several editors of the newspapers throughout the State have kindly offered their assistance in aiding the organization of the service. Much interest in the work was found among the people visited, and no doubt its value will be appreciated as soon as they test it. The railroad companies responded to requests for passes over their lines, but, with transportation furnished, there are expenses of about $2 each day in traveling which should be provided for. To properly organize the service much traveling is a necessity. The clerical work will soon increase rapidly, and it is a question of only a short time when assistance will be a necessity. If a good assistant could be furnished now, he could materially aid in the work.

Very respectfully, your obedient servant,

T. F. TOWNSEND,
Sergeant, Signal Corps, U. S. A., Assistant in charge.

The CHIEF SIGNAL OFFICER,
Washington, D. C.

The Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanic Arts. Founded 1824.

OFFICE OF THE SECRETARY,
Philadelphia, July 7, 1887.

SIR: Referring to the accompanying report of Sergeant Townsend respecting the progress being made in the establishment of a weather service for this State, I beg to state that I have read the same and find the statements therein contained to be substantially correct.

The meteorological committee of the institute, to which the subject was originally referred, appreciated the fact that no effective work in so large an area as that covered by the State of Pennsylvania could be accomplished without financial aid from the State. The committee therefore prepared and promoted the passage of a bill appropriating $3,000 for the service. This bill only became an act during the last days of the legislature,

about one month ago, consequently the work of organizing the service may, at this time, be said to be only fairly commenced. Considerable preliminary work had been done pending the action of the legislature, looking to the selection of suitable observers in various localities, more particularly among the colleges, in securing the effective co-operation of the principal railway companies, etc. The plans of the committee are being gradually matured, and within a few months it is hoped that the utility of the service will begin to be manifest. The points to which the committee will direct all its efforts for some time to come will be the establishment and equipment of the central stations in the several counties and the establishment of repeating flag stations as numerous as possible.

The committee desires to express its entire satisfaction with the zeal, ability, and energy displayed in conducting the detail work of the service by Sergeant Townsend. The work will speedily grow to such proportions, if, indeed, it has not already done so, when it will be necessary to provide him with one or several assistants. I beg to remain, on the committee's behalf,

Your obedient servant,

WM. H. WAHL,
Secretary.

Lieut. H. H. C. DUNWOODY,
U. S. Signal Office, Washington, D. C.

Report of a special committee of the Franklin Institute to formulate a plan for a State weather service.

[Presented at the stated meeting, held Wednesday, December 15, 1886.]

At a meeting of the special committee to formulate a plan for a State weather service, held Wednesday, December 15, 1886, the following report was adopted, and ordered to be reported to the next monthly meeting of the institute.

W. P. TATHAM,
Chairman.
WM. H. WAHL,
ALEX. E. OUTERBRIDGE, Jr.
LORIN BLODGET.
M. B. SNYDER.

The subcommitte appointed to consider the advisability of establishing a "State weather service" for Pennsylvania, under the auspices of the Franklin Institute, and in conjunction with the United States Government Meteorological Bureau in Washington, begs leave to offer the following

REPORT.

Experience has proved that the practical benefits to be derived from the daily forecasts of storms, cold-waves, etc., are greatly restricted, especially in the agricultural districts, by the want of sufficient facilities for disseminating the official information promptly. Farmers, who are especially interested in these forecasts, are usually so located that the reports do not reach them in time to be available as predictions, and they are therefore of little value to this class of the community. In order to overcome this deficiency, the experiment has been tried of establishing, in several of the Western and Southern States, an auxiliary "State weather service" with volunteer observers located at available points working under a chief, residing at some central locality, who in turn is in daily telegraphic communication with the Government Bureau in Washington. By the aid of this organization it is found that the weather forecasts may be much more rapidly and widely disseminated than has heretofore been practicable. The State services already established have proved of great value to the citizens, and have afforded material aid to the Meteorological Bureau in its efforts to extend its usefulness. It is at the request of the officers of this Bureau that the Franklin Institute is considering the advisability of fostering the establishment of a similar service for Pennsylvania.

The Chief Signal Officer offers to aid the work by furnishing all blank forms upon which the reports are written, by supplying a competent instructor, and an inspector, who will visit the stations, compare and correct the instruments, collate the reports, etc.

It appears from the statements of the officers of the Meteorological Bureau that the State services already established have proved invaluable to the communities in which

they are placed; and this committee is of the opinion that a similar service would prove equally valuable in Pennsylvania, and that it is a proper subject for the careful consideration of the Franklin Institute.

By means of the efficient "railway bulletin service," now in operation by the different railroad companies in this State, such a system is both possible and practicable at a very small expense. By these companies the weather indications of the Signal Service are daily posted at over 300 stations well located for points of distribution.

By the "flag weather signals," which can be displayed at these centers, and repeated or duplicated at proper distance from each other, the entire State can soon be covered with symbols, and the indications or warnings given to every locality participating in the work.

The value of such information is sufficient to induce the belief that if a system was properly organized the people would very generally aid in these displays by volunteering their services.

While the stations of the Signal Service may be numerous enough for storm and frost warnings and general weather predictions, they are not sufficient to determine the climatic conditions of our State sufficiently for the best scientific and practical results.

They are mere outposts for general work, so far apart that numberless meteorological phenomena occur that, being unrecorded, are lost for comparison and study.

The value of systematic and continuous records of atmospheric changes can not be over estimated. There is not an industry in the country that could not be benefited by them.

For this purpose a thorough system of taking and recording observations should be organized in every county. No doubt, with proper encouragement, a sufficient number of volunteers could be found for this work, and in a short time such an array of climatic data might be collected that valuable and comprehensive information might be given concerning the meteorological condition of any part of the State.

As above remarked, several of the States have already experienced and recognized the practical benefits to be derived from a "State weather service," and have appropriated money to properly furnish the stations with the necessary Government standard instruments for measuring the pressure, temperature, humidity, rainfall, wind, etc.

This should be done by the State of Pennsylvania, as the benefits would be general.

An appropriation of $3,000 will properly equip one station in every county, and furnish means for the monthly publication of a weather review containing the tabulated reports of the observations.

After the stations are once established the cost of maintaining a continuous service will be slight.

The following is a price-list of standard instruments, as published by the Signal Service:

Barometer	$30 00
Thermometers:	
Dry-bulb	3 00
Wet-bulb	3 00
Maximum	5 00
Minimum	4 00
Rain-gauge	2 50
Instrument shelter	5 00

For the reasons herein stated, we suggest:

That the Franklin Institute at once organize a "State weather service" for Pennsylvania, having for its object the collection and collation of climatic data and phenomena, and the dissemination of the weather forecasts, storm and frost warnings of the Signal Service.

That the work of taking observations, disseminating forecasts, warnings, etc., be accomplished by volunteer service.

That the co-operation of railroad companies, telegraph companies, telephone companies, newspapers, and others, who can materially aid in the dissemination of information, be solicited.

That the offer of the Chief Signal Officer of the Army, to furnish a member of the Signal Corps to assist in the work, be accepted.

That an effort be made to secure an appropriation of $3,000 from the State for the purchase of instruments and for the publication of the observations in a tabulated form.

That all institutions of learning throughout the State be solicited to take an active interest in the collection of meteorological data and the study of the science, for practical application to the various pursuits of life.

That at least one observer be secured in every county of the State, ten of whom should take and record barometric readings.

That copies of all meteorological data relating to the State be secured and placed on file in the central office.

That immediate action be taken to secure observers and displaymen, so that the work may be commenced, if possible, on January 1, 1887.

That if all the work suggested can not be at once carried out, such portions as can be done without expense be started as soon as practicable.

That the management of the service be placed in charge of a committee, appointed by the institute, with power to regulate the service according to requirements.

At the stated meeting of the Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanic Arts, held Wednesday, December 15, 1886, the foregoing report was adopted and the committee continued, with instructions to carry into effect the plans proposed.

WM. H. WAHL,
Secretary.

AN ACT to establish a state weather service in this Commonwealth for the purpose of increasing the efficiency of the United States Signal Service by disseminating more speedily and thoroughly the weather forecasts, storm and frost warnings for the benefit of the citizens of this State, and for the purpose of establishing and maintaining in each county thereof meteorological stations for the collection of climatic data and making an appropriation therefor.

Whereas by reason of the limited facilities of the United States Signal Service the practical benefits to be derived from the weather forecasts, storm and frost warnings, issued from the Chief Signal Office at Washington, D. C., are greatly restricted, especially in the agricultural districts, by the want of proper means for disseminating these official reports promptly; and

Whereas by the organization of a State weather service co-operating with the United States Signal Service the weather forecasts, storm and frost warnings, hitherto accessible only to a very small proportion of our people may be much more rapidly and widely disseminated throughout the State, whereby the value of the same to the agricultural and other interests will be largely increased; and

Whereas the climatology of the State has never been observed and recorded in as thorough and systematic a manner as is necessary for the best promotion of the various industries; and

Whereas the State weather services already established and maintained by State aid in Alabama, Illinois, Indiana, Iowa, Minnesota, Mississippi, Missouri, Nebraska, Massachusetts, Ohio, Tennessee, and other States, co-operating with the Signal Service, have proved of great value to their citizens, especially to the farmers, who stand most in need of prompt and accurate information of anticipated climatic changes for the protection of their crops and who are most directly benefited thereby; and

Whereas at the request of the Chief Signal Officer, the Franklin Institute of the State of Pennsylvania for the Promotion of Mechanic Arts has proposed a plan for the organization of an efficient weather service for this State: Therefore,

SECTION 1. *Be it enacted by the senate and house of representatives of the Commonwealth of Pennsylvania in general assembly met, and it is hereby enacted by the authority of the same,* That the secretary of internal affairs of this Commonwealth be, and is hereby, authorized and directed to name and appoint, on the recommendation of the Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanic Arts, one or more competent observers in each county of the State for the purpose of taking, recording, and transmitting observations of the atmosphere pressure, temperature, humidity, rainfall, wind, and other meteorological phenomena occurring in their respective localities; and the secretary of internal affairs is hereby authorized and directed to purchase and furnish to each of said observers such standard meteorological instruments as are used by the United States Signal Service, and such signal flags and other necessary equipments, and such necessary clerical expenses as shall be designated and approved by said Franklin Institute.

SEC. 2. The central office of the State weather service shall be located in the city of Philadelphia, at which the forecasts and warnings of the United States Signal Service shall be received and from which the same shall be disseminated throughout the State, and to which the State weather-service observers shall send their observations.

SEC. 3. The management of the work of the Pennsylvania State weather service shall be under the supervision and direction of the Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanic Arts, and the said Franklin Institute is hereby authorized to make such use of the information thus collected by the publication of a weather review and by other proper means as will best promote the usefulness of the service to the citizens of the State. And the services of the said Franklin In-

stitute and of the said observers of the State weather service shall be made without compensation.

SEC. 4. The sum of $3,000 be, and the same is hereby, appropriated, out of any money in the treasury not otherwise appropriated, for the purpose of carrying into effect the provisions of this act.

Approved May 13, 1887.

[Inclosure II.]

SOUTH CAROLINA STATE WEATHER SERVICE.

COLUMBIA, S. C., *July* 10, 1887.

SIR: In compliance with your letter of June 15, I beg to submit the following report on the South Carolina weather service:

This service was inaugurated in October, 1886, on the arrival of Observer Graham, who was detailed to assist me in the organization and management. During that month but little was done beyond the purchase of flags, meteorological instruments, etc., correspondence looking to the selection of observers, displaymen, and with the various railroad companies to solicit their co-operation. During November Observer Graham exhibited signal service instruments at our State fair and delivered an address before our farmers, setting forth the objects of the State weather service, and at the close of the month he visited sections of the State, with instruments, and established ten stations. During December the co-operation of the Columbia and Greenville Railroad and branches was secured, and signals were distributed to about thirty stations along that road. With the beginning of 1887 more display stations were established, and, with the co-operation of the South Carolina Railway Company, the number of stations in operation reached sixty-five.

The principal obstacle contended with in the prosecution of the work was the objection raised by the Western Union Telegraph Company, by which that company prevented the railroads from sending the indications as railroad business. This necessitated either the abandonment of the service or a greatly increased expenditure for telegraphic service.

Not wishing to abandon the indications, which are of much value to the people, I assumed the expense of telegraphing the daily report to about twenty-five stations, with the hope that your Service might be able to assist me to some extent. Unfortunately, however, the failure of the general deficiency bill and your appropriation for telegraphic purposes prevented any aid from you.

The expense entailed on the State service by the continuation of telegraphic reports has absorbed the funds available for State weather service purposes. I am pleased to acknowledge your letter of June 28, in which you authorize me to telegraph the indications, cold-wave warnings, etc., after July 1, to sixty stations daily except Sunday. This timely assistance is appreciated, and will enable me to continue the service in this State.

I found no disposition on the part of our people to purchase their own instruments, and I was therefore obliged to furnish them. I have on hand at this moment ten sets of instruments, which I shall distribute as soon as possible.

As stated above, I am unable at present to devote any money for this expense, and I would ask that transportation to various parts of the State be furnished Corporal Graham, so as he may distribute these instruments and thus perfect the service. I have requested him to apply for transportation, and I would respectfully urge that it be furnished him, if possible.

The South Carolina weather service has at present sixty-five stations, thirty of which receive railroad telegraphic reports (the wires being owned by the railroad). The others are situated on Western Union lines. Care will be taken to establish stations only at such points as are demanded by the public interests and where the benefits will be felt. We have thirteen meteorological stations in the State. After the ten sets of instruments referred to above shall have been distributed, making twenty-three stations in all, this service will be, in my opinion, well equipped for the collection of climatic data.

During the cotton-growing season we receive, in addition, the reports from your cotton region observers, furnished us by the Signal Service observers at Charleston, Augusta, and Wilmington.

Notwithstanding all obstacles, the service continues to grow in popularity, which I think is evidence of its usefulness to our people, and I frequently receive letters asking that stations be established.

The feature of weekly weather crop reports recently adopted by you is, I consider, one of the most valuable and important advances that could be made; the bulletins issued

from your office and that issued by us for this State are read with interest by our farmers, merchants, and manufacturers.

In view of the serious damage we have sustained at times by floods in this State, I am convinced that a system of river reports would be of great value to us. With timely warning we could in many instances move stock, etc., and thus save thousands of dollars. I was instructed by our board of agriculture to correspond with you in regard to this matter, asking your co-operation and assistance to such extent as your appropriation will allow, cost of river-guages, and other information. I shall supplement any aid you give me in this connection, as far as I am able, with the limited means at my command.

I beg to suggest that Columbia be made a full telegraphic station of the Signal Service, taking complete observations and receiving the telegraphic reports daily. I am informed that the Signal Service has only one station in this State, viz: Charleston; and in view of the growth of Columbia, its increasing trade and manufacturing interests, especially its cotton trade, I am sure that the Signal Service reports would prove of benefit to our citizens, and I hope that you may be able to establish a full station here. We have manifested much interest in the Signal Service in this State, and when North Carolina and other States abandoned the indications on account of expense, we continued, and thus our service has cost us a considerable sum, and we would like to receive all the benefits from the reports, etc., it is possible to give us. If this be made a reporting station, an assistant observer will be necessary, and I trust your appropriation may be sufficient to admit of your detailing an assistant and establishing a full station. In this connection I may state that you will have office room, fuel, etc.

In conclusion, permit me to give expression to my warm appreciation of the valuable assistance I have received from Corporal Graham in the accomplishment of what without his aid might have proven an arduous task. His clear and thorough understanding of the exigencies and possibilities of the situation have rendered comparatively easy the labor of formulating a plan of operations, and his untiring energy in carrying out the plan adopted has been largely instrumental in raising the State weather service to the place it now occupies in the confidence and consideration of our citizens.

I am, very respectfully,

A. P. BUTLER,
Commissioner of Agriculture, Director S. C. Weather Service.

The CHIEF SIGNAL OFFICER,
Washington, D. C.

[Inclosure III.]

MISSOURI STATE WEATHER SERVICE.

IOWA CITY, *June* 27, 1887.

DEAR SIR: Replying to your circular letter of June 1, I beg to report that the work of the Missouri weather service during the last year has been practically the same as for the last four or five years. The service will have been in operation ten years on December 1, 1887. It has been the main object to collect information regarding rainfall in Missouri, but observations have also been made on temperature as well. These latter are of limited value only by reason of a want of supervision of thermometer exposure and also by reason of the fact that the thermometers used have never been compared with any standard.

The time of the director is mainly occupied with other matters, and only such time could be given to the work of the director as could be spared, and this has been very little.

The rainfall observations are, I think, fairly good.

In the future the work can be carried on with much greater effect, as it seems likely that the services of an assistant may be furnished by the Signal Service. I can give little personal attention to this work before September, as I shall be absent from Saint Louis during the summer.

Very respectfully,

FRANCIS E. NIPHER.

The CHIEF SIGNAL OFFICER,
Washington, D. C.

[Inclosure IV.]

TENNESSEE STATE WEATHER SERVICE.

(No date.)

SIR: I have the honor to submit herewith a report of the Tennessee weather service from its organization to June 30, 1887.

The Tennessee weather service was regularly organized in April, 1883, and the first complete report was made for that month. In February of that year, the service was partly organized under the direction of Hon. A. W. Hawkins, then commissioner of agriculture, statistics and mines, who had been provided by the Chief Signal Officer with a number of rain-gauges and blanks for distribution among voluntary observers, and at the close of the month he made a partial report covering about half the month. In March, Commissioner Hawkins was succeeded in office by Hon. A. J. McWhirter, who made a partial report for March. Early in April, a supply of standard dry-bulb thermometers was received from the Chief Signal Officer, together with blank reports and envelopes for distribution among the voluntary observers appointed by Commissioner Hawkins and others appointed by the new commissioner, and regular observations of temperature and rainfall were begun. The work of organizing the corps of voluntary observers, and of compiling and tabulating the reports devolved on me as secretary of the bureau of agriculture, etc. The number of voluntary observers reporting regularly during the first two years was about forty, but changes were constantly taking place. Some of the observers, after the novelty had worn off, found the service somewhat irksome and discontinued their observations and reports, and the work of changing observers, and sometimes localities for stations, added no little to the trouble of keeping up the proper number of stations so as to get fair averages of the meteorological conditions throughout the State. This trouble continues to the present time, but to a much less extent.

At my suggestion, the Chief Signal Officer very kindly instructed the United States Signal Service observers at Knoxville, Chattanooga, Nashville, and Memphis to co-operate with the Tennessee weather service, which they have done promptly, and they have rendered very efficient aid, and added very materially to the value of the monthly reports.

At a meeting of the State legislature in January, 1885, the first since the organization of the State service, Commissioner McWhirter, in his biennial report to the governor, suggested that an appropriation be asked of the legislature in order to promote the interests of the weather service, and to make it of more practical benefit to the people of the State by supplying the observers with additional instruments that they might make their observations more complete, and to provide for publishing more complete reports, etc. Governor Bate, in his message, very strongly urged this, but the legislature did not see fit to make the appropriation. In June of that year, Commissioner McWhirter decided to surrender the charge of the weather service, alleging as a reason that it was too great a tax on the bureau, with no profit, as had been argued by some of the members of the legislature. Finding that I could not dissuade him from this purpose, and earnestly desiring to preserve the weather service intact, I induced the members of the State board of health to take charge of it and foster it as far as their limited appropriation would permit, and since July 1, 1885, I have conduted the service under the auspices of that body. It is proper to state here that Commissioner McWhirter gave me, as his secretary, cheerful permission to retain supervision of the service and to continue in the work of conducting the business provided it did not interfere with my duties as secretary of the bureau.

In December, 1885, the Chief Signal Officer very kindly authorized me to establish in the State sixteen stations to receive the daily weather indications and display them by signal flags. This was the first movement to bring the practical benefits of the Signal Service directly before the people of the State, and it is gratifying to know that it was greatly appreciated in the communities where these signals were displayed.

I have briefly outlined the history of the service to show that its existence has not continued without effort. It remains for the future to develop its value and usefulness.

Since the 1st of July of last year, the operations of the weather service have been without anything of a special nature or import. While the number of active observers in the State is somewhat smaller than during the two preceding years, it is gratifying to know that those who have remained faithful to their voluntary duties have been making more satisfactory reports, and the general work of observation and of recording is conducted in a more systematic manner.

During the latter part of the year, the Chief Signal Officer authorized the establishment of six stations to receive the cold-wave warnings. These were located at Rogersville, Cookeville, Waverly, Bolivar, Dyersburgh, and Guthrie, which is just north of the

Kentucky State line. By this a great number of people were brought to feel the practical benefits of the Signal Service.

At the meeting of the legislature, last January, Governor Bate in his message again urged the propriety and importance of making a suitable appropriation for the weather service, to procure additional instruments to enable more stations to be established, and to increase the facilities of disseminating the information to be thus gained among the people; but, as was the case with the preceding body, the suggestions went unheeded.

One of the great obstacles to the proper recognition of the State service by the people of the State is the lack of facilities for publishing the monthly reports as full as they should be and to give them proper circulation. While the generosity of the State board of health is greatly appreciated, and to be commended in giving space to the weather service in its bulletin and incurring expense in printing our reports, still the space is too circumscribed, and many things are omitted each month which might be profitable.

The service is altogether too limited for our State, and it is my desire and intention, if possible, to increase the number of stations during the summer and fall. Tennessee, owing to its peculiar shape and position possesses rather anomalous features and conditions of climate, and I imagine that a complete meteorological record of the entire State for a year or series of years would be vastly interesting to a scientist. We have territory that should be covered by convenient stations, and where, no doubt, valuable meteorological data are lost each month for the want of an observer. But an observer without instruments can do but little except to note casual phenomena.

During the year the stations at Waverly and Dyersburgh, which had been discontinued for many months, were reinstated. The station at Howell, in Lincoln County, was discontinued and a new one established at Fayetteville, the county seat. A new station was established during March at Vernon, Hickman County, and gives promise of being one of the most valuable in the State.

The State board of health have been contemplating a change in the publication of the Monthly Health Bulletin, and the question of continuing the publication of the meteorological reports was considered at a recent meeting. The matter is now in the hands of the executive committee of the board, who have power to make any arrangement as to the future publication of the Bulletin, with or without the weather reports, as they may think best. A decision will be made during the present month.

With the kindly co-operation of the Signal Office at Washington in distributing daily weather indications and cold-wave warnings, and in keeping before the people the records of the data gathered and collated each month, the State service is gradually becoming more appreciated by the people at large as they are gradually becoming educated as to its value.

Having been, since its organization, virtually in charge of the service, I have felt a deep interest in its progress and its success. It has always been with me an ambition to have the Tennessee weather service second to none in the country in point of value as an accumulation of data, and if I have contributed to making it perhaps valuable to future scientists and chroniclers, my reward is complete.

I am, General, very respectfully, your obedient servant,

H. C. BATE,

Private, Signal Corps, U. S. A., Director Tennessee Weather Service.

The CHIEF SIGNAL OFFICER.

[Inclosure V.]

KANSAS STATE WEATHER SERVICE.

TOPEKA, KANS., *July* 1, 1887.

SIR: Pursuant to request from your office, I have the honor to transmit herewith a report of the work done by the Kansas State weather service, with suggestions relating thereto.

The service was begun in 1880 by the subscriber, with the co-operation of the Topeka Scientific Club. Circulars were issued and observers to the number of twenty secured in various parts of the State. Records of their observations were compiled and reports published in the daily papers of Topeka. Two years later it was thought best to unite this attempt with the meteorological work done under direction of the State Board of Agriculture, and the subscriber received the appointment of State meteorologist. This change was particularly suggested by Lieutenant Dunwoody on a visit to this city.

The last three biennial reports of the State Board of Agriculture contain meteorological summaries prepared by the subscriber, and the monthly and quarterly reports from the same office were prepared in like manner.

During this period valuable assistance was given by the Signal Service at Washington by supplies of blanks, "penalty" cards and envelopes, instruments, and valuable publications from the Government office.

In pursuance of the wise and liberal policy which has characterized the administration of the Signal Service, an assistant was granted to carry on the work of the State service. This officer, Sergeant Jennings, arrived the latter part of October, 1886. After his arrival Circular No. 1 (herewith submitted) was prepared, and on November 12 was mailed to 320 newspapers, covering every county in the State.

The central office was established at Washburn College, which furnished rooms and had secured a telephone line. After November 14 the indications were received daily, and were furnished to the newspapers and railroads, as were also the cold-wave warnings upon their receipt. The cold-wave signals were displayed from the pole at the corner of Eighth and Kansas avenue. It is intended hereafter to display these signals from the college buildings, in addition to the above.

At my request Sergeant Jennings has visited different parts of the State to lay the matter of a State service before the people, and to establish stations; as a result of which I now have stations in successful operation in Coffey, Montgomery, Chautauqua, Elk, Sumner, Republic, Ellsworth, Sherman, and Morton counties. We also receive reports from Franklin, Douglas, Ottawa, Lyon, and Riley counties, and from the Signal Service stations at Leavenworth, Dodge, and Las Animas, and by co-operation with the Union Pacific Railroad, from the stations on this line between Brookville and Denver.

At several of its annual meetings our work has been brought to the notice of the Kansas Academy of Science, and at my suggestion Sergeant Jennings attended the meeting of the State Horticultural Society at Emporia, December 7 and 8, and the State sanitary convention, at Wichita, December 9 and 10. He also introduced the State service to the favorable notice of the State Grange, which met at Olathe, December 16 and 17; and in February visited and inspected the stations which report to us on lines of the Union Pacific Railroad.

On the authority of the Chief Signal Officer, contained in a letter dated office Chief Signal Officer, November 9, 1886, I selected six important points in this State to which it was intended to send the cold-wave warnings at Government expense, but the manager of the Western Union Telegraph office in this city refused to send these messages, marked "Paid Government rate," unless each message was prepaid.

On June 9 a telegram was received from the Chief Signal Officer, authorizing the telegraphing of daily indications to four points within the State, in accordance with which the following addresses were selected, viz:

E. Y. Dollenmeyer, Wilson, Kans.; W. B. Mead, Oberlin, Kans.; F. E. Sherman, Stockton, Kans.; the postmaster, Belleville, Kans.

Again I am refused by the local manager of the Western Union to transmit messages marked "Paid Government rate," unless they are prepaid. I respectfully ask the Chief Signal Officer to request the Western Union Company to direct their local agent here to relay these indications and all cold-wave warnings to the above addresses promptly upon their receipt, as such a practice will save valuable time.

I inclose copies of our usual summer bulletins, beginning with February. There yet remains much to be done to bring our State weather service up to my ideal. One of the first requisites is more effective State aid. So far the work I have done has been wholly without remuneration, the office of State meteorologist being without salary. The promise made by the Signal Service for furnishing me an assistant is very timely, and gives valuable aid.

Likewise the authorization, in your communication of June 28, with reference to telegraphic messages, will help me to bring information directly to the public through the press, and through displayed signals, that will go far to popularize our work and prepare the way for State recognition.

There are in some quarters very extravagant and ignorant expectations of what the weather and Signal Service can do, and people must be educated to properly value weather indications, and regard these as but one of the benefits to be gained by well-conducted meteorological work.

I could use with great advantage to the service some instruments, chiefly thermometers and rain-gauges, to supply to our voluntary observers. Can your office help in this direction?

Expecting to be at the American Association, which meets in New York in August, I trust I may confer there with other meteorologists in furtherance of our common work.

Very respectfully,

J. T. Lovewell,
Director Kansas State Weather Service.

General A. W. Greely,
Chief Signal Officer, U. S. Army, Washington, D. C.

[Inclosure VI.]

Report on the work of the New England Meteorological Society for the year ending June 30, 1887.

In the prosecution of the work of the society there has been constantly kept in mind the fundamental object of its organization, namely, the advance of meteorological science in New England.

Regular observations.—As a foundation for climatic and other studies, regular observations of temperature and precipitation have been reported from 140 to 150 stations every month, including a few in the Hudson Valley. Among these there are ten stations of the Signal Service and five established by the Appalachian Mountain Club in the White Mountains.

Bulletin.—A bulletin has been published monthly, giving a tabular summary of the reports collected, a comparison with normal values, and a general account of the weather of the month; the latter is prepared with especial regard to the dependence of weather types on cyclones and anti-cyclones, or areas of low and high pressure, such as precipitation in cyclonic areas, warm and cold waves accompanying the passage of cyclones, inversions of temperature in anti-cyclones, fœhn-like temperatures in the mountain valleys, thunder-storms, and sea-breezes. An advance proof of the tabular portion of the bulletin is sent to the Signal Office in Washington as early as possible every month. The bulletin is sent to all members and observers of the society, to the Signal Office and to all the State weather services, to certain libraries, and to a limited number of subscribers and foreign correspondents.

Special investigations have been undertaken from time to time. The study of thunder-storms, begun in 1885, was continued in 1886, and is now in progress for the current summer. About four hundred observers are co-operating in this work, which is in charge of Sergt. O. N. Oswell, Signal Corps. The expense of the undertaking is defrayed by a grant from the Bache fund of the National Academy. A study of the sea-breeze on the eastern coast of Massachusetts has been begun this summer with over one hundred observers in charge of Mr. L. G. Schultz, Signal Corps. Assistance in this work is received from the Harvard College Observatory. Within the year an "investigation of cyclonic phenomena in New England," carried on by Prof. W. Upton, with assistance from the Elizabeth Thompson Science Fund, has been published in the American Meteorological Journal. It is concerned with the distribution of precipitation in New England as determined by the passage of cyclonic storms shown on the Signal Service weather maps. Reprints of this and other papers have been distributed through the Smithsonian Institution. Additional investigations will be undertaken as opportunity arises.

Co-operation with the Signal Service has from the outset been of the greatest assistance to the society. The current work of the society, especially the preparation of the bulletin with the present large number of observers, would be impossible without the aid of Sergeant Oswell. Special work has also received essential support from the Signal Service. In return for this assistance the society desires to advance the work of the Signal Service in every way, as well by furnishing local reports of temperature, precipitation, crops, etc., as by increasing the publicity and usefulness of the official weather predictions.* The display of weather-flags has been encouraged by the society, and is now in charge of Sergts. O. B. Cole and J. H. Sherman, of the Boston and New Haven Signal Offices.

Status of the society.—The society has at present about one hundred members, several residing outside of New England. So small a number as this allows only a slow growth in certain desirable directions; but the more serious obstacles to successful development are in a fair way of being overcome. Aid in furnishing instruments to observers in unrepresented localities is offered by the Appalachian Mountain Club and the Harvard College Observatory. The inspection of stations has been begun by Mr. A. Lawrence Rotch, proprietor of the Blue Hill Observatory, and instruments belonging to observers are tested without charge by Prof. S. W. Holman, of the Massachusetts Institute of Technology. Public meetings are held by the society three times a year.

Plans for further work.—It is believed that the greatest immediate usefulness of the society to the people of New England will result from such studies as will lead to an improvement in the weather predictions issued by the Signal Service. The too frequent failure of the predictions has weakened public confidence in their value, and has thus combined with the relatively subordinate position of agriculture in New England, and with the prompt and extensive distribution of predictions in the daily papers, to prevent the growth of any general interest in the display of weather-flags. This lack of interest is greatly to be regretted, and must be overcome if possible by discovering means of making better predictions. It is therefore desired to undertake as soon as possible a comparison of the numerous and detailed records that the society possesses for the last two

years with the corresponding weather predictions, so as to determine not merely an indiscriminate average percentage of verifications, but to discover those types of weather in which failure to predict is most frequent, and then to seek for methods of avoiding such failures. It is already notorious that storms coming from the Atlantic to the Carolina coast commonly bring unpredicted bad weather to New England, and that storms which hesitate over Nova Scotia in their northeastern course often maintain bad weather after the coming of fair weather is announced. The early detection of these exceptional movements may be made possible by a study of similar exceptional cases, and it is thought that the society could not render a greater service to the Signal Office on the one hand and to the people of New England on the other than in the successful prosecution of such an investigation.

There are certain other ways in which further growth is essential to continued success. A more prompt publication of the monthly bulletin is desirable, and will be possible as the society grows financially stronger. The improvement of instruments used by observers, and the more equal distribution of stations is called for and is under way. The instruction and encouragement of observers in something more than routine observation and record is desirable. The mountains and hills of New England offer eligible sites for observatories like that founded on Blue Hill by Mr. Rotch. Private observatories fitted with certain instruments giving continuous automatic record, such as those established by Mr. Childs in Brattleborough, Vt., and by the Jackson Company, Nashua, N. H., are much needed. Automatic instruments will undoubtedly come into more general use as they become more widely known. Many cities might imitate Newburyport, Mass., in maintaining an accurate series of records such as are there made by Mr. Pike. Local societies may well follow the example of the Hampshire Natural History Society, of Northampton, Mass., in undertaking a detailed thermometric survey of its home district. It is probable that a subsection of our society will be formed in New Hampshire, and perhaps eventually in our other States, for the purpose of gaining more assistance, and thus attending more closely to local affairs than can be done under the present organization of the society.

A proposition has recently been received from Prof. E. C. Pickering, director of the Harvard College Observatory, from which the society may hope for the greatest advantages in the publication of its reports and studies.

Respectfully submitted.

WM. H. NILES,
President.

W. M. DAVIS,
Secretary.

CAMBRIDGE, MASS., *July* 6, 1887.

[Inclosure VII.]

MISSISSIPPI STATE WEATHER SERVICE.

UNIVERSITY, MISS., *July* 7, 1887.

SIR: I have the honor to submit the following report of the work of the Mississippi weather service for the year ending July 1, 1887.

The progress made is in many respects very considerable. Mr. Marcus J. Wright, United States Signal Corps, was assigned to duty here, and arrived October 1, 1886. An office was opened in the Magnetic Observatory Building of the University of Mississippi. An extensive correspondence was begun with interested persons throughout the State, and circular letters were published in many of the newspapers of the State, with the purpose of organizing a corps of volunteer observers. A large interest in the work of the State weather service was developed, and the co-operation of twenty volunteer observers secured. Later, in the spring of 1887, many of these, together with others, have undertaken to send in weekly crop reports.

The greatest obstacle to the enlistment of volunteer observers is the lack of suitable thermometers and rain-gauges.

Correspondence with the superintendents of all the railroads operating in the State in reference to the daily transmission of weather indications over their telegraph lines, and the display of corresponding signals on the sides of their baggage-cars, was undertaken early in the fall of 1886. The replies received showed the kindly interest of all the superintendents in the work, but showed also some serious obstacles. Most of the railroads in Mississippi do not own their telegraph lines, but use the lines owned by the Western Union Telegraph Company, under such restrictions as prevented the free trans-

mission of weather indications. The following-named railroads, through the courtesy of their superintendents, are transmitting the indications to stations: Louisville, New Orleans and Texas Railroad; the Vicksburg and Meridian Railroad; the Memphis and Charleston Railroad, and the Georgia Pacific Railroad, Mississippi division. It was found most convenient to have the daily indications furnished to the railroad officials in Memphis, Tenn., and Vicksburg, by the signal officers at those points, as the railroads, excepting the Georgia Pacific, have their central offices at those points.

In regard to the display of signal flags, efforts were made to have each community receiving the indications through the railroad telegraph office provide a set of flags and have them hoisted. In the case of many stations these efforts have been successful. The indications are also posted on the bulletin boards in the railway offices receiving them.

With reference to weather signals displayed on the sides of moving trains, our efforts have not yet proven successful, the superintendents of our principal railway lines making objection to the plan proposed, on very plausible grounds. The plan suggested was to display painted tin signals on the sides of baggage cars. The objection was that the three principal railroads in the State, the Mobile and Ohio, the Illinois Central, and the Louisville, New Orleans and Texas, have very long lines, running through several States north and south, and that cars of any kind are liable to be transferred from one division to another at any time. The service proposed could not be made efficient in Mississippi without a very full equipment of signals, and the careful attention of one or more employés, especially as the indications on any day might not be the same for Tennessee, Mississippi, and Louisiana, or the Gulf coast, through which regions the trains on these roads pass daily. There is a growing demand from the farming population for such a display of signals as will give the benefits of the indications to parties along the railroad lines. Recently calls have been made through the newspapers for such service in the interest of the hay crop, which is growing to be one of large importance in this State.

I am maturing a scheme which I think will be both feasible and acceptable to the railroad superintendents, provided I can procure the necessary signals. The plan is to arrange a set of signal flags (of painted sheet tin, or painted canvas, or stout bunting) on a staff 5 or 6 feet high erected on one side of the platform just above the cow-catcher of each engine that goes out of the engine-house, at each end of the divisions of the railroads, before 3 o'clock p. m. each day. The advantages are, (1) one set of signals can be seen from both sides of the train; (2) signals can be displayed easily on every moving train; (3) signals can be bulletined with regular train orders, and put in position on engines before they leave the engine-house; (4) as the run of each engine is usually not more than 100 miles, and the time from five to ten hours, no confusion as to localities for which indications are given need arise. The above plan will soon be proposed to the railroads operating in Mississippi, and I have good hope of its adoption, provided I can procure the signals, for which I have no funds now. This system would reach a very large number of agriculturists in our State.

I take great pleasure in reporting that the cold-wave warnings of last season were highly appreciated, and proved of great practical value.

In the vicinity of Crystal Springs, one of the stations receiving the warnings from the United States Signal Service through this office, is located a very large amount of capital, invested in the cultivation of early fruits and vegetables for Northern markets. I am informed by a distinguished citizen of the town that probably the entire prospect for early tomatoes and other vegetables would have been ruined but for the timely warning of cold waves in February and March. About 1,000 acres are planted in these early vegetables, and the crop is worth many thousands of dollars.

My efforts to secure the interest of the people of Mississippi, and of their Representatives in Congress, in the work of the United States Signal Service have met with very gratifying success, and I trust that our next legislature, which meets in January, 1888, will give such financial support to the State weather service as will very materially increase its efficiency.

At my solicitation the trustees of the University of Mississippi have met the expense of issuing the monthly weather reviews and circulars for the last year, and have arranged to meet similar expenses for the next twelve months.

Arrangements are now being made to locate in the most useful way the stations to which, in accordance with late instructions from the Chief Signal Officer, U. S. Army, the daily indications are to be sent. On this point I very respectfully suggest that, since thirty or more repetitions of the same message from this place to various points in the State may have to be made daily, some modification of the usual method of keeping telegraphic accounts might possibly be made, which would avoid the necessity of the signal officer here and the manager of the Western Union Telegraph office having to keep copies of each message sent to each town.

I respectfully call your attention to the fact that the large and increasing amount of shipping frequenting the Gulf coast of this State, on account of the lumber trade, the

fishing interests, and the Ship Island quarantine station, renders it very desirable that several stations for storm warnings and cautionary signals should be established, if practicable, between Mobile and New Orleans. Three such stations could be so located as to meet, perhaps, all demands at present.

The peculiar train schedules of the principal railroads traversing Mississippi make it generally impossible for the daily papers published in the cities of this and adjoining States to reach the smaller towns until the afternoon of the day of publication. This fact makes our people almost entirely dependent for their knowledge of the weather indications upon their distribution by this service.

With such aid as the United States Signal Office may be able to give, and with the pecuniary assistance which I hope the State legislature will afford next winter, the outlook for the effective working and practical usefulness of the State weather service is very encouraging.

In conclusion, I take great pleasure in mentioning the intelligent, careful, and diligent manner in which Mr. M. J. Wright, U. S. Signal Corps, has discharged the duties of his position. To his labors the successes of the last year are very largely due.

I have the honor to be, very respectfully, yours,

R. B. FULTON,
Director Mississippi Weather Service.

The CHIEF SIGNAL OFFICER,
Washington, D. C.

[Inclosure VIII.]

NEW JERSEY STATE WEATHER SERVICE.

NEW BRUNSWICK, N. J., *July* 5, 1887.

SIR: In compliance with your request, an annual report is furnished, showing the progress made in organizing the New Jersey State Weather Service.

This service was started at the solicitation of General Wm. B. Hazen, the late Chief Signal Officer, to co-operate with the Signal Service. The directorship was accepted with great reluctance, owing to numerous other engagements, still, with the expectation of rendering a public service that would prove to be of great benefit to the agricultural interests of the State, and with the assurance that the Government service would furnish a Signal Service assistant to perform the clerical work pertaining to such an organization, I assumed the office.

Sergeant Hiram J. Penrod, of the Signal Corps, on duty in New York City, volunteered to act as assistant, and organization in September, 1886, began by the issue of the following circular:

[Circular No. 1.]

NEW JERSEY STATE WEATHER SERVICE,
NEW JERSEY AGRICULTURAL COLLEGE,
New Brunswick, September 30, 1886.

The undersigned has been requested by the Chief Signal Officer of the Army to organize in New Jersey a State weather service, to co-operate with the Government Weather Bureau.

General Hazen says: "The object of a State weather service should be to observe and utilize every feature of the weather that affects the prosperity of the inhabitants of the State as to crops, health, life, etc., omitting, perhaps, only those few items already provided for by the General Government at Washington, such as general storm predictions. The State service is, therefore, essentially a plan for gathering and utilizing local climatic data, and eventually it will define precisely the localities most favorable or unfavorable to special crops, diseases, etc."

The idea is certainly a noble one. The plan of the State service is to have a central office and a State director, and at least one voluntary observer in each county, who will keep a record of temperature and rainfall, and report the same to the central office of the State monthly.

Observers wishing to make continuous records of wind force, humidity, and of the barometer will be aided in all possible ways, both by the State and Government service, for such observations are locally of equal value to those of temperature and rainfall.

The State director will supply, from the Chief Signal Officer at Washington, the instruments necessary for all the observations spoken of above at greatly reduced cost

from catalogue prices. These instruments will be compared with the Government standard at the Chief Signal Office, and a memorandum of error of each will be furnished with the respective instrument.

The central office will also furnish, free of charge, to all local stations the necessary blanks, instructions, Monthly Weather Review, containing reports of the various State weather services, and all other useful information communicated by the Chief Signal Officer for that purpose.

Attention is also invited to the following advantages of a State weather service:

(1) It will be the means of soon securing better predictions of weather changes and storms.

(2) It will bring the benefits of the Signal Service of the United States into every county of New Jersey participating in the State local organization.

(3) It will soon prepare New Jersey for a system of storm signals displayed from railroad trains that will be widely beneficial to agricultural interests.

(4) It will give to every county the Government standards for temperature, rainfall, wind velocity, humidity, etc., which are sources of useful public information.

(5) It will put within reach of local agricultural societies means of accurate observations, which in the course of years must be valuable to any locality in the study and adaptation of cereals.

(6) It will bring the science and methods of the Signal Office within the reach of the high schools of the State, offering teachers and pupils alike excellent opportunity to study a wide range of the application of science to foster and protect agricultural industry.

(7) It will lead to the collection of rainfall statistics to enable engineers to better estimate the supply of canals, also the sudden downpours to guard against in laying out sewers in cities. It will lead to a correct knowledge of rainfall over the different watersheds of the State, for the purpose of giving data for supplying the water-works of cities, towns, and villages.

(8) It will lead to the forming of reliable meteorological records for use in legal cases.

(9) It will lead to publishing the temperature of our summer resorts, drawing attention of outside parties to their desirability as summer residences.

(10) It will lead to a better practice of medicine, when physicians throughout the State can study disease with reliable and accurate meteorological facts by their side, and for sanitary purposes correct meteorological statistics are invaluable to the practitioner in applying preventive remedies for the public good.

For about $15 the instruments for temperature and rainfall can be secured, viz:

	Cost.
Thermometers:	
Exposed	$2.50
Maximum (self-registering)	5.00
Minimum (self-registering)	4.00
Rain-gauge	1.25
Measuring stick	.25
Instrument shelter	2.00
Total	15.00

To take the observations requires but little time daily, and the exercise is especially agreeable to those that are interested in natural science. Several States have already entered on the work with most gratifying results. The complete success which is anticipated will only come when each State does its part, and it should not be said of New Jersey that we have neglected a matter of such importance to the entire community, especially the farmers.

The co-operation of the press throughout the State is asked to lay this subject properly before the people, knowing full well that liberal people, who naturally have an interest in useful sciences, will cheerfully contribute both money and time to further the object sought after.

All trades and professions are more or less affected by changes in the weather, and the study of the phenomena is becoming more and more interesting to every man and woman in the country.

Two hundred volunteers are needed throughout the State for this work.

GEO. H. COOK,
Director.

Responses to the call for voluntary observers came in from all sections of the State, and the reports received in December justified the issue of the first State bulletin. The first bulletin showed reports from 17 stations, and the aggregate reports received since

amounted to 44, an average of over 2 reports from each county of the State. The bulletins have been very kindly appreciated by the people, especially by the agriculturists, who take fondly to facts that may be made useful to them in studying the cause and effect of the weather on the crops.

The demand for the State bulletin necessitated printing the monthly reports. The New Jersey Weather Chronicle sprang into existence and has since published the bulletin. Dr. H. J. Penrod, the editor and proprietor of the sheet, gave the bulletin wide circulation, and the State board of agriculture at a late meeting gave some assistance to the enterprise, being impressed with its great usefulness.

Very little difficulty has been experienced in securing voluntary observers. New Jersey abounds with scientific gentlemen, and ladies, too, who gladly aid in taking observations when it is known their labors are appreciated and will not be lost to science. All sections of the State are represented in the work going on. Several new stations will be opened soon. Reports are promised from Plainfield and Asbury Park at an early date.

Observers have very generally purchased standard instruments and have erected shelters with due regard to secure proper exposure, so as to obtain the best possible results.

So far only the collection of rainfall and temperature statistics have been contemplated, but observers find little additional trouble in filling in other phenomena called for by the forms issued.

Efforts were made during the year to secure the co-operation of railroads in posting at telegraph stations the Signal Service railway bulletin. Bulletin boards at many places have been put up in this way, in which the 1 a. m. forecasts for New Jersey are posted for the benefit of the traveling public.

Weather signals are displayed at a few places in the State, mostly in the larger cities, where the scheme is used as an advertising medium.

Cold-wave stations were authorized at eight stations in the State by the late Chief Signal Officer, but before the value of them could be definitely ascertained the dispatches had to be discontinued for want of appropriations for telegraphing purposes.

The prospective usefulness of the State service is susceptible of improvement in many directions. It being so young and somewhat experimental, no action was taken towards securing legislation, as has been done in other States. The service and subject being somewhat problematical in character and of great interest to the people, further time seemed necessary for consideration.

The voluntary observers in this State responded promptly when the Chief Signal Officer called for weather-crop information for use in the preparation of the Signal Service weather-crop bulletin. This weekly report, compiled from observations received from such a corps of skilled and trained observers, can not prove otherwise than useful to the country.

I have no suggestions to offer at this time.

Very respectfully, your obedient servant,

GEORGE H. COOK,
Director.

The CHIEF SIGNAL OFFICER,
Washington, D. C.

[Inclosure IX.]

OHIO METEOROLOGICAL BUREAU.

It has been the aim of the directors during the past year to complete the instrumental equipment of all stations, and to secure complete and prompt reports from all, thus improving the character of our reports.

The corps of observers now reporting regularly numbers 50, of whom 5 are officers of the United States Signal Service, and 10 report rainfall only. Four new stations have been established during the year, as follows: Greenville, A. J. Katzenberger, observer; Findlay, J. W. Zeller, observer; Georgetown, Dr. Thomas W. Gordon, observer; Newcomerstown, Dr. A. M. Beers, observer.

Stations at Granville and Wooster and the rain-gauge stations at Bryan, Cedarville, and Clintonville have been discontinued, because of our inability to find persons at those points who would report regularly and continuously throughout the year, and who could expose their instruments properly.

The observers now reporting are very faithful in the discharge of their duties. The task they have assumed is by no means light, involving, as it does, the reading of their instruments at 7 a. m., 2 p. m., and 9 p. m. every day in the year, the recording of the

readings, 18 numbers each day, and the copying and reporting of all once each week or month.

The labor involved is thus considerable, but the hardest thing about their service is the obligation to be at their instruments promptly at the times named. When we add to this fact that their service is entirely without pay, the obligation the people of the State and others interested in the work (for interest in it is by no means confined to Ohio) are under to them is seen to be great. The board of directors have sent them individually a vote of thanks, which we are sure will be warmly seconded by all those interested in meteorological work.

The directors are considering the possibility of lightening the task of the observers by providing them with suitable instruments for recording automatically the principal features of the weather, and have asked for a small sum to enable them to carry out the plan at several stations. Such instruments can be had at moderate cost which will work reliably and can be compared at convenient times with the standards now in the hands of the observers to insure the accuracy of the automatic records. This will materially lighten the work of the observers, and will also give us records of greatly increased value, because they will show the atmospheric conditions existing at any moment and the progressive changes taking place at all points so provided at the same moment of time, a matter of great importance in the study and prediction of storms.

The distribution of the Signal Service weather predictions by display upon baggage-cars has continued through the year, and gives great satisfaction to those within sight of the trains. The roads carrying these signals, number of trains, etc., are as follows:

Columbus, Hocking Valley and Toledo.—From Columbus to Toledo; Toledo to Columbus; Columbus to Athens; Athens to Columbus; Logan to Pomeroy; Pomeroy to Logan.

Columbus and Cincinnati Midland.—From Columbus to Cincinnati; Cincinnati to Columbus.

Columbus, Mount Vernon and Delaware.—From Columbus to Cleveland; Cleveland to Columbus.

The signals are also telephoned, by arrangement with the Columbus Telephone Company, to the train dispatchers on the Columbus and Cincinnati Midland, Columbus, Hocking Valley and Toledo, and Columbus, Mount Vernon and Delaware roads, and by them transmitted by telegraph to the agents along their lines, who give the predictions to any one applying for them.

The predictions have also been repeated, by telegraph at Government expense, from Columbus to the following points, the parties to whom they are sent agreeing to make a proper display of the predictions for the benefit of the public:

Zanesville, Canton, Wauseon, Urbana, Youngstown, Pomeroy, Hamilton, Fultonham, Coshocton, Covington, Gallipolis, Saint Clairsville, and Newcomerstown. In addition to the above-named places, Hillsborough and McConnellsville received the predictions from Columbus, but during the year the messages were discontinued, and by an arrangement with the Chief Signal Officer, Hillsborough receives the predictions from Cincinnati, and McConnellsville from Zanesville. Yellow Springs also received predictions through the Bureau for the greater part of the year, and by request these were discontinued near the close of the year.

In addition to the above distribution of signals under the direction of the Bureau, a wide circulation of them is effected through the leading daily papers of the State, and also through the individual enterprise of railroads, telegraph, and telephone companies and local corporations, to such an extent that is impossible for us to keep informed about all of them.

The attention paid to the signals by the general public and the confidence placed in them are well shown by the demand for such wide distribution, and emphasized by the complaints which reach us when mistakes are made or interruptions occur.

The monthly reports have contained special reports besides the meteorological readings.

Mr. Thomas Mikesell, observer at Wauseon, furnished reports on trees and shrubs, on fruit-trees, on field and garden crops, on flowers, and on birds for the preceding year, for the November report; also a report on birds for the January number. Mr. F. Y. Davis sent a report on temperature at Lima, Ohio, for the past twenty-one years, published in the March number. The June number contains an account by Mr. Mikesell of the tornado of June 24, 1886, which passed near Wauseon. Other less extended special reports were published each month. Mr. Mikesell's observations on trees, crops, birds, etc., for the past year will be found in this report.

It will be seen from the financial statement herewith presented, that while no deficiency has been made, the expenses of the Bureau have exceeded the $2,000 appropriated for its support, cutting down the balance on hand from the preceding year. The closest economy consistent with the efficiency of the service has been practiced, but we have been unable to keep within the sum allowed us. An increased amount has been asked for the

coming year, which must be granted if the work of the Bureau is to be continued upon its present plan.

The board of directors suffered a serious loss in the resignation of Mr. Chamberlain, whose warm interest and hearty labors in behalf of the Bureau proved of so great value in its organization. His place is taken by Mr. L. B. Bonham, who has shown a similar active interest in the growth of the Bureau.

The generous co-operation and aid of the U. S. Signal Service has continued through the year, placing the Bureau under an ever-increasing obligation. The death of the Chief Signal Officer, General Hazen, is a great loss to the various State services, in which he took an active interest. His associates in the office at Washington have always warmly supported his plans for the aid of the State services, and it is hoped that his successor will be able, through means placed at his disposal by Congress, to continue General Hazen's liberality.

BENJ. F. THOMAS,
Director.

[Inclosure X.]

MICHIGAN STATE WEATHER SERVICE.

LANSING, MICH., *August* 13, 1887.

SIR: I have the honor to submit the following report of the progress of the State weather service from the date of my arrival (November 22, 1886) to July 31, 1887.

Being detailed under special orders 96, 1886, to proceed from Detroit to Lansing, Mich., and organize a State weather service, I arrived at Lansing November 22, 1886, and immediately began active operations to that end.

After consultation with the State board of agriculture, the present secretary of state, G. R. Osmun, it was decided to carry on the work under the auspices of the State Board of agriculture, with Sergeant Conger as director of the service. December 1, 1,000 circulars were issued by the board of agriculture calling for volunteer observers. Under this call, 25 persons volunteered and ordered instruments through this office, which were purchased of H. J. Green, New York City, and distributed February 3, 1887. On January 12, 1887, a bill was introduced by Senator J. W. Giddings for an appropriation of $8,587.50 for the "equipment. support, and expenses of a State weather service" (bill inclosed), and at a meeting of the State board of agriculture, February 22, the board formally took charge of the service, as provided in the act signed by the Governor, February 3, 1887, and appointed Sergeant A. B. Conger as director for two years, and gave him entire charge of the work, which he has carried on to the present time. Under the provisions of this act 50 complete sets of instruments were purchased, and 39 of these sets are now in the hands of observers and 11 remain yet to be issued. Besides these 39 sets issued, there are the 25 first purchased. making 54 sets issued through this office. Reports are also received from 8 stations of the service, making a total of 78 observers, including 6 voluntary observers of the State board of health that furnish reports to this office. The instruments purchased by the State include 1 barometer, 1 exposed, 1 wet bulb, 1 maximum and 1 minimum thermometer, 1 rain-gauge and measuring-stick.

The first monthly report of observations of the Michigan weather service was published March 10, and included the observations for the month of February with 20 observers. Four thousand five hundred copies of this report, which is published with crop report by the secretary of state. were issued. and 3,800 copies have been issued monthly since that date. The number of observers of the State weather service now is 78—an increase of 58 since February. It is the intention to have an observer in each of the 84 counties of the State.

Weather signals.—On December 1, 1887, there were 30 stations in the State (which had been established by Sergeant Conger while in Detroit) which were displaying weather signals; at the present date there are 137, an increase of 107 stations. This is due greatly to the liberal terms made by the Michigan Bell Telephone Company for the transmission of the weather indications to stations on their lines, and it also shows the strong hold this branch of the service has taken on the people of the State. The code used in all the new established stations is the code promulgated by Prof. P. H. Mell, jr., of Auburn, Ala. (see inclosed card). This service is constantly on the increase, and, with the appropriation granted by the State for the distribution of weather indications and cold-wave warnings, it can be placed within the reach of nearly every citizen in the State.

Railway weather signals.—The Detroit, Grand Haven and Michigan Railway first began to carry the weather signals on their trains (the trains leaving terminal points in the morning carrying the signals). They began December 1, 1886. December 15, 1886, the

Chicago and Grand Trunk Railway began, also the Grand Trunk between Port Huron and Detroit; and February 1 the Port Huron and Northwestern Railway and the Michigan Central Railway system, the Grand Rapids and Indiana Railway, and the Chicago and Western Michigan Railway were furnished with signals to begin operations August 1. These signals are of iron and are carried on the side of the baggage, cars and were furnished by the State weather service.

On May 21 this office issued a weekly weather crop bulletin and has continued it weekly to date, with good success, all newspapers receiving it in time publishing it regularly; 50 copies are issued every Saturday night.

This portion of the report should properly be first. The State board of auditors, at their regular monthly meeting, held the last Wednesday in November, granted quarters for the State weather service in the old State building, and had it very nicely furnished. The office has not been as yet moved, although the State board of agriculture are anxious to have the central office located at the Agricultural College, 3 miles east of the city.

Ex-Governor R. A. Alger, Governor Cyrus G. Luce, Secretary of State G. R. Osmun, President Edwin Willets, H. B. Baker, secretary State board of health, and the members of the State board of agriculture have each interested themselves towards the success of the service, and to President Edwin Willets, of the college, the honorable secretary of state, G. R. Osmun, and honorable William B. McCreery, of the State board of agriculture, especial credit should be given for their personal efforts to carry this service to success, in obtaining the desired appropriation. No especial difficulty has been experienced in establishing this service, except possibly having voluntary observers in sparsely-settled counties.

Recapitulation:

Voluntary observers	78
Weather signal stations	137
Trains carrying weather signals	25
Weekly crop bulletins issued (a week)	50
Monthly weather bulletins issued (a month)	3,800

Very respectfully, your obedient servant,

A. B. CONGER,
Sergeant, Signal Corps, U. S. A., Director.

The CHIEF SIGNAL OFFICER,
Washington, D. C.

A BILL making an appropriation for the equipment, support, and expenses of a State weather service.

SECTION 1. *The people of the State of Michigan enact*, That there shall be, and hereby is, appropriated out of the State treasury for the purchase of fifty complete sets of instruments, $2,087.50; for weather signals, $200; for distribution of weather indications and cold-wave warnings, for the display of weather signals by telephone and telegraph, $4,000; for stationery, records, books, and incidental expenses, $700; for salary of one assistant to the director of the State weather service, who shall be appointed by the State board of agriculture, $1,600; aggregating the sum of $8,587.50; of which the first two items shall be paid during the year 1887, and the remaining shall be paid, the one-half during the year 1887, and the other half during the year 1888; which said moneys appropriated by this act, or so much thereof as shall be necessary, shall be expended, under the direction of the State board of agriculture, for the purpose aforesaid, by the director of the Michigan State weather service, detailed for the purpose from the Signal Corps of the United States Army, and shall be drawn from the treasury on presentation of the proper certificates of said board to the auditor-general, and on his warrant to the State treasurer. All property purchased or acquired under the provisions of this act, or received for the purpose of carrying the same into effect, shall be and remain the property of the State of Michigan, and shall be under the direction and control of the State board of agriculture; and the instruments, signals, and record books so purchased or required or received shall be issued only in accordance with such rules and regulations as said State board of agriculture may prescribe.

SEC. 2. A summary of observations of the director of the Michigan State weather service, herein named, shall be furnished monthly to the secretary of state for publication and distribution.

SEC. 3. There shall be assessed upon the taxable property of the State in the year 1887 the sum of $5,437.50, and in the year 1888 $3,150, to be assessed and levied in

like manner as other taxes are assessed, levied, and paid, which tax, when collected, shall be credited to the general fund to reimburse to the same the sums to be drawn therefrom as provided for in this act.

[Extracts from the governors' messages relative to State weather service.]

LANSING, *Thursday, January* 6, 1887.

The house met pursuant to adjournment, and was called to order by the speaker.
Prayer by Rev. Mr. Franklin.
Roll called; quorum present.
Hon. Russell A. Alger, the retiring governor, then read his message, as follows:

STATE WEATHER SIGNAL SERVICE.

The General Government has sent to the capital of the State an experienced member of the Weather Signal Corps, and undertakes to give to us the full benefit of that useful service so far as it can do. This system has been of the greatest value to commerce for years past, and since it has been extended in its operations so as to reach the agricultural and other inland industries of some of the States its usefulness has been much more marked. In order to make this service of more practical and widespread benefit the legislature will be asked to render some very slight but imperatively needed assistance, and I recommend that this be done as early as possible in the session.

Hon. Cyrus G. Luce, the incoming governor, then read his message, as follows:

SIGNAL SERVICE.

The United States Signal Service Department has detailed an officer and made provision to establish a station at Lansing. The benefits to be derived through this service are as yet but partially understood, but its claims are such as to challenge your careful attention.

MICHIGAN WEATHER SERVICE.

Weather crop bulletin for the week ending July 30, 1887.

Temperature.—The temperature for the past week is reported above the normal in all sections.

Precipitation.—The precipitation is below the normal; no rain has fallen in the southern and central sections during the past week.

Sunshine.—The amount of sunshine for the past week is above the normal.

Condition of crops.—The corn and potato crops are suffering very severely from the high temperature and absence of rain, and reports from all sections state that the corn is curling up, and the potatoes will not yield a two-thirds crop, if the present conditions of the weather do not change, and heavy rains fall. The pastures are all dried up and burned with the heat. The report from Ganges, Allegan County, states that peaches in some localities in this county are shriveling and dropping from the trees.

Oceana County reports that apples and pears are a large crop.

Frost was reported on the morning of the 23d in Clare and Genesee counties, with slight damages.

[Inclosure XI.]

ALABAMA STATE WEATHER SERVICE.

AUBURN, ALA., *August* 18, 1887.

SIR: In accordance with your circular of June 15, I have the honor to transmit herewith a report of the working of the Alabama weather service during the year ending June 30, 1887.

The number of observers reporting for the service is not as large as that given in the last report made to you. This is due to the fact that when the work was first inaugurated in this State it was quite difficult to determine who would make good observers, and many persons entered the service with the idea that they would be compensated for

their work at an early day in the future. I had taken special pains to notify the people through the papers that there would be no money available for paying salaries, and the work must be one of love and for the best interests of the State. Some have become tired and withdrawn after a few months' work, and others have expressed a disinclination to carry on the observations unless they were compensated. The force has, therefore, been reduced to twenty-eight good, efficient, and earnest workers. Every effort has been made to have the instruments properly exposed and the readings made at the time adopted by the Signal Service. The monthly bulletins were issued regularly excepting for the month of June, when the office, with its outfit, was destroyed by fire. Since the 1st of May special weekly bulletins have been issued indicating the effects produced upon the crops by the changes of the weather. These special bulletins have been very favorably received by the papers and the farmers of the State, and I think much good has been accomplished by them.

At irregular periods this service has issued bulletins upon important subjects pertaining to the science of meteorology. The subject matter for these bulletins has been prepared by prominent writers in Alabama. Some of these special bulletins were compiled from time to time from the large amount of material accumulated at the central station.

Certain problems concerning the climate of the State have been investigated, but not sufficient progress made to enable the service to pronounce a satisfactory solution. The work in this direction will be continued through another year. It is thus noticed we are not simply collecting data, but our effort is to collate the facts and draw conclusions for the benefit of agriculture and commerce.

The daily weather-predicting system was steadily kept in operation until your order discontinuing the same on account of the failure of the deficiency bill before Congress. These daily telegrams were highly appreciated by those communities that availed themselves of the benefits to be derived from the predictions. And the railroads throughout the State, with two or three exceptions, had offered the free use of their wires, and every facility in their power, for expediting this work and giving the people along their lines the full advantages of the system. The Western Union Telegraph Company entered a protest against the use of the wires for this purpose, claiming that the contract prohibited the use of the lines for any other than railroad business. When the telegrams were renewed in June most of the railroads withdrew from the former system on account of the complaint of the Western Union. This crippled the work so much as to render it almost useless to a large proportion of the State. Fortunately, however, your circular letter authorizing the transmission of one hundred telegrams daily, except Sundays, from this office to one hundred points within the State surmounted, to a great degree, the difficulties presented by the Western Union. I am very well satisfied now that, with judicious management in the selection of these stations, the people of the State will be admirably served with the weather and temperature forecasts. I am inclined to believe that the system has been greatly benefited by the selection of the centers from which these messages must be sent each day. As soon as your letter authorizing these one hundred telegrams reached me, I prepared the following notice, and published it in every paper in the State, so that each community was informed of the change in the system:

WEATHER SERVICE.

[To be given to the whole State from the Central Office.]

AUBURN, ALA., *June* 4.

The director is gratified to inform the people throughout the State that he is now able to give the entire State the full benefit of the weather-predicting system. The Chief Signal Officer has just informed this office that on and after July 1 one hundred telegrams may be sent each day, except Sunday, over the Western Union Telegraph wires, to predict the condition of the weather for the benefit of the people of the State. These messages will be sent from this office with charges of transmission paid, and they will contain the weather, cold wave, and frost warnings issued for the localities by the Signal Service.

The Chief Signal Officer authorizes the payment for transmission of these messages only, and not for any expenses which may be made for delivering same. It will be necessary, therefore, for the towns which desire to reap the benefits of these predictions to provide themselves with a set of flags, four in number and costing $2, and have them raised on a pole, centrally located, in accordance with instructions contained in the telegrams. Cards explaining signals will be supplied by the director free of charge to those applying for them. This predicting system is not new to many sections of the State, since it has been in successful operation for more than two years. The expense for a set of flags and display pole is very little, and this is a fine opportunity for agricultural clubs and farming committees. Great care will be exercised in the transmission of these messages, and if the director finds that a community does not appreciate the work and ex-

pense incurred in its behalf the telegrams will be immediately discontinued. Applications should be made as early as possible, and the name of party to whom the telegrams are to be sent must be carefully stated.

Respectfully,

P. H. MELL, Jr., *Director.*

CHIEF SIGNAL OFFICER,
Washington, D. C.

On the morning of June 24, the main building of the Alabama Polytechnic Institute, in which the office and archives of the State weather service were located, was consumed by fire. The instruments, papers, books, and everything belonging to the service were destroyed. This is greatly to be regretted, because much valuable material had accumulated through several years' work, and all carefully classified and stored away for easy reference. Many papers important in determining the climate of the State were destroyed. In connection with the office was a well-equipped printing department, sufficiently large to do all the work required by the service. It was also totally destroyed. Our monthly bulletins were, therefore, necessarily discontinued. They will be resumed October 1, 1887.

Respectfully submitted,

P. H. MELL, Jr.,
Director Alabama Weather Service.

[Inclosure XII.]

NEBRASKA STATE WEATHER SERVICE.

Annual report, year ending June 30, 1887.

With the beginning of the year included in this report, the Nebraska weather service covered the following stations manned by volunteer observers and making monthly meteorological reports to the central office at Boswell Observatory, Doane College, Crete, Nebr.:

Station.	Observer.	Station.	Observer.
Ashland	Dr. George Shedd.	Nebraska City	Prof. J. B. Parmelee.
Crete	C. E. Chadsey.	Ogallala	Dr. L. M. Line.
Dawson	M. L. Libbee.	Purdum	T. C. Jackson.
De Soto	Charles Seltz.	Ravenna	Erastus Smith.
DeWitt	Fred. C. Ware.	Red Willow	Mr. Royal Buck.
Fairbury	Dr. Humphrey.	Stockham	J. W. Gray.
Falls City	Dr. A. B. Newkirk.	Stromsburgh	S. S. Kauffman.
Fremont	Rev. J. E. Heaton.	Syracuse	P. W. Risser.
Harvard	Marx F. Wistrom.	Vick	C. Schieldstream.
Hay Springs	William Waterman.	Weeping Water	G. Treat.
Lincoln	Prof. J. G. White.	West Hill	J. L. Truman.
Marquette	John Ellis.	West Point	E. G. Bruner.
Minder	Joel Hull.	York	Prof. D. P. Nicholson.
Mission Creek	M. K. Walker.		

The monthly meteorological summaries of the two Signal Service stations of Omaha and North Platte were also furnished by the courtesy of the Chief Signal Officer and incorporated with the voluntary reports of observers.

The following flag stations, selected by the director of the State weather service, were furnished with the daily forecasts of the Signal Office by telegraph at the expense of the Signal Service:

Station.	Flagman.	Station.	Flagman.
Ashland	T. J. Pickett.	Juanita	S. L. Brass.
Beatrice	W. A. Wagner.	Lincoln	Albert Watkins.
Columbus	E. C. Brake.	Louisville	Thomas Shryock.
Crete	C. E. Chadsey.	Nebraska City	J. B. Parmelee.
Fairbury	W. W. Watson.	Stromsburgh	S. S. Kauffman.
Falls City	Alfred Minnick.	York	F. L. Wheedon.
Grand Island	C. L. Howell.		

These stations also made monthly reports to this office of the number of failures and of correct predictions, some of them being also regular observers reporting monthly meteorological summaries.

The number of observers connected with the service July 1, 1886, is summarized as follows: Director of service, two Signal Service observers, twenty-seven volunteer observers, thirteen flagmen; in all there were forty distinct persons engaged in the service.

About the 1st of October, 1886, Lieut. H. H. C. Dunwoody informed the director of this service that he had succeeded in securing the detail of an observer of the regular service to assist in the work of the State weather service, a most acceptable favor, as it promised to relieve the director of much routine work which he had found it difficult to provide time for, besides securing more prompt attention to these duties.

Accordingly, in October, 1886, Private C. D. Burnley was transferred from the Signal Service station at Omaha to Crete, and entered at once upon his duties as assistant.

On account of the scarcity of observers in the newly-settled portions of the State north and west, it was thought desirable to have Mr. Burnley make a tour through that region establishing new stations. Transportation was accordingly furnished by the Signal Office over the new Fremont and Elkhorn Valley Railroad to Chadron, and also to Creighton and Dakota City in November, 1886. This resulted in the establishment of the following new stations:

Stations.	Observers.	Stations.	Observers.
Chadron	F. J. Houghton.	Norfolk	Louis Sessions.
Creighton	Dr. George Roberts.	O'Neill	P. C. Corrigan.
Dakota City	W. C. Dibble.	Rushville	C. Mosler.

The monthly reports from the United States station at Valentine were also furnished by the Signal Office. During the year, also, the following other observers have been secured: Tamora, J. S. Williams; Sargent, J. S. Spooner; Scribner, Jesse A. Nason.

Early in the year the experiment was tried of sending out by mail to all accessible post-offices a copy of the daily weather predictions of the Chief Signal Officer; this was done by means of franked postal cards, on which were printed the necessary explanations, and then from day to day there were stamped upon this with rubber stamps, in proper colors, the sun, moon, and star symbols, then in use for weather flags, and also the date; these were sent out to about sixty post-offices, and displayed for the information of the public. As there were mails in three directions soon after noon, these bulletins reached their destination in most cases with the least possible delay, less even than the 1 a. m. prediction by telegraph does, since this is a night message, not delivered till morning. Very general satisfaction was expressed with these bulletins, though they were not made a permanent feature of the service because the Postmaster-General decided that it was not legitimate for directors of State weather services, themselves not members of the Signal Corps, to use the franks for this purpose.

The distribution of predictions by telegraph to the thirteeens towns above named continued until March 1, 1887, when they were discontinued by order of the Chief Signal Officer. As it was now legitimate to use the franks again through Private Burnley, for the distribution of weather messages, the Chief Signal Officer was again asked to make a special 10 a. m. prediction for eastern Nebraska, to be distributed as before by mail. These bulletins were displayed as before in the post-offices, but, in addition, flags were secured and began to be displayed at a number of points.

PUBLICATIONS.

There has been regularly issued from the central office a monthly bulletin and crop report, and these have been sent out to be republished by the newspapers of the State as well as distributed to observers. Beginning with January, there has been published with the bulletin a monthly map in two colors, showing the distribution of the rainfall over the State. One paper, the Daily State Journal, of Lincoln, has even been to the expense of engraving and printing this map with the text of the bulletin.

It is believed that the year has shown reasonable progress in the workings of the service and in the interest of the public in it.

GOODWIN D. SWEZEY,
Director.

[Inclosure XIII.]

ARKANSAS STATE WEATHER SERVICE.

LITTLE ROCK, ARK., *July* 23, 1887.

SIR: I have the honor to submit the following report of the Arkansas State weather service. It may be said that this service dates its organization from the 1st of January, 1887, for, although indications and cold-wave warnings had been sent out for some months before, and several towns had and were using regular indication weather flags, there were no reports made or records kept until that date. In December, 1886, and January, 1887, about four hundred letters were sent out to persons in the State asking their co-operation in establishing a State service and making regular reports of temperature and rainfall. Many of these were never answered, but from eight towns promises were made that reports would be sent. This formed the nucleus of the service, to which February added two more stations, one in March, four in April, twelve in May, and five in June, making a total of thirty-two stations making reports, not including the signal offices at Fort Smith and Little Rock. During the year complete sets of flags were purchased at twenty-one towns and cold-wave flags at seven other points. Indications were sent free over the railroad wires to those points reached by railroad wires and, at Government expense, cold-wave warnings to six other points, and collect to one station. There was considerable interest manifested in the service at these points. January 18 orders were issued by the officials of the Gould system that indications could no longer be sent free over those wires. This left six places with flags but no way of getting indications, but by permission obtained from the Baltimore and Ohio and Arkansas Telegraph Companies for free service they were immediately resumed to all but three points. This, however, was of but short duration, for the Gould system obtained control over the Arkansas Valley Route in May and the Western Union Telegraph Company purchased the lines of the Arkansas Telegraph Company, preventing their being sent over those lines, and also cutting off the connection with the Baltimore and Ohio Telegraph Company, so that at the end of June there are no indications sent out except to three points paid at Government expense.

There is no State recognition of the State weather service in this State, although it is very highly thought of by the State officers, and the governor has recommended the passing an act to provide for one to three consecutive general assemblies, in each of which a bill has been introduced, and which it was generally thought would pass at the last session of the legislature, but failed again owing to there being no one to explain the advantages of such a service but the observer at this station, and he was too busy with station duties and the education of uninstructed assistants to do so, being engaged in taking a regular observation at the time the committee met, to whom this bill was referred.

A monthly report has been published since the first of January, giving the reports of the stations in a highly condensed manner, also answers to questions pertaining to meteorology, a description of the manner of using the weather indication flags, and miscellaneous articles on meteorology and the use of instruments, tending to create an interest in the subject and to educate the public to a better appreciation of the service. One thousand copies of this are sent out monthly to persons both in and out of the State, and an exchange is made with nearly every paper published in the State, the exchange list numbering over one hundred. This serves a very valuable double purpose, as the State press frequently copy and credit articles from the Weather Review, creating a still greater interest in the study of meteorology. Also, by reading the local news of different sections of the State, many local phenomena become known, also the general climatic conditions of the State for each week. This Review is being more sought after daily by parties investing, or contemplating doing so, in the State. At first the paper was taken charge of by Mr. Geo. R. Brown, who agreed to bear the expense of getting it out for what could be made from the advertisements printed in it. After four months he decided it was not paying, so gave it up, and the observer here has not only to compile it but solicit advertisements to bear its expense. In this the land department of the Gould system of railroads has given valuable help by large advertisements.

The principal obstacle contended with is the cost of instruments. Few who take sufficient interest to make good reports can afford to purchase them, although some have done so. Then the difficulty of communicating with the proper persons in different places. Could the towns of the State be visited in person and the advantages and benefits of a State service be explained, a number of towns would procure instruments and make reports. Also, as your observer here has had the entire work of organization to perform, he has not had time enough to devote to it, having been fully occupied with station duties and without competent help at the station.

To properly develop a State weather service here will require the entire time of one man for several months, and he should also be provided with facilities for short excur-

sions to different parts of the State to arrange for reporting stations. The present status is good. Most of the observers are men who take a decided interest in it and are reliable.

As yet the service is hardly enough developed to say what its prospects will be; but the present appearance is that, if properly fostered, aided, and encouraged, it will be a positive benefit to the State and one of the best sources of information relative to local climatic changes and phenomena possible to have.

Its uses will be to assist in the collection of meteorological data and facts, to give reliable facts relative to climate to persons interested therein, to develop the State by showing its advantages, to assist in the forecasting the weather by obtaining a knowledge of local phenomena and causes which affect the dynamic forces which act on the climate and influence it, to give a broader dissemination of the indications and warnings of the Signal Service by having reliable and well-known men in different localities to publish them, and by comparison with statistics of agriculture and other industries to determine the localities best adapted to the production of special crops or industries; also to educate the inhabitants of the State to derive a more general benefit from the reports of the weather, perhaps to prevent loss of life and property from climatic changes and phenomena.

Relative to increasing its value, as great a number of reports as possible should be received; were it possible to furnish instruments, good observers could be had in every county in the State. Next, one man should have but little else to do than attend to the State service. If good assistants were kept at your station here the observer could attend to it, but with an inexperienced assistant in his office the entire station duty falls on the observer; add to this the instruction of and thinking for that assistant, and but little time remains for State service work. The station should have at least one competent assistant and another who could be under instruction. Also the "Weather Review," or printed monthly report, should be fostered. At present the monthly expense of issuing this is $18 a month. Were facilities for printing it supplied it could be issued for about $6 a month, which amount could easily be raised by the advertisements; that is, the type and material to be furnished, the work could be paid for in this manner.

In conclusion, I would say, to sum the foregoing up, the State weather service here will be a decided advantage to the general public and to science if encouraged in the least by allowing a competent person time to attend to it and furnishing the few meager requirements necessary to start it.

Very respectfully, your obedient servant,

W. U. SIMONS,
Private, Signal Corps, in Charge of Arkansas State Weather Service.

The CHIEF SIGNAL OFFICER,
Washington, D. C.

[Inclosure XIV.]

INDIANA WEATHER SERVICE.

PURDUE UNIVERSITY,
Lafayette, Ind., August 11, 1887.

SIR: I have the honor to submit the following report in relation to the Indiana Weather Service for the year ending June 30, 1887:

The service has been reorganized, and is now under the auspices of the Purdue University and the Indianapolis Board of Trade, with the co-operation of the United States Signal Service and the Chicago, Saint Louis and Pittsburg Railway Company, the Lake Erie and Western Railway Company, the Indianapolis and Vincennes Railway Company, the Cincinnati, Indianapolis, and Saint Louis Railway Company, the Cleveland, Columbus, Cincinnati and Indianapolis Railway Company, and the Indianapolis, Decatur and Springfield Railway Company.

The work consists of two parts: (1) The collection of meteorological data from different points, and the compilation, publication, and distribution of the same. There are at present thirty-two stations from which reports are received, and special efforts are being made to increase the number of stations in northern counties.

The form of the published report has been changed from a single sheet to an eight-page pamphlet.

(2) The distribution of "indications" furnished by the U. S. Signal Service, and the display of weather signals.

This distribution is effected at Indianapolis by an officer of the Signal Corps detailed for that purpose. The indications are at present furnished to 19 parties. This does not represent the number of signals displayed, since one telegram provides for the display of five sets of signals in Tippecanoe County. The number of parties displaying signals would have been much greater had it not been for the necessary interruption of

the work from April to July. Since then parties have been less willing to take hold of the work.

Considerable difficulty is experienced in obtaining and retaining reliable observers, only about one-third of the counties in the State being represented. In the distribution of telegrams some inconvenience is caused by the fact that telegrams are not furnished to railroads who do not display signals. While some roads have not made a display of flags, they have been willing to send telegrams over their wires and furnish them to parties displaying flags. This was of special value to the service, since it permitted display stations to receive their telegrams two hours before the other telegraph offices opened.

The usefulness of the State service has increased under the new organization, and the prospect for extending the work is good.

At present the University pays all the expenses of the service except that for telegrams, postage, blank forms, and the salary of the officer detailed at Indianapolis, these expenses being paid by the U. S. Signal Service. It is hoped that at the next meeting of the legislature means may be provided for adding to the supply of instruments and for meeting other necessary expenses of the service.

The publication of a weekly bulletin is a feature that will be provided for as soon as practicable.

A copy of the bulletin for June, including that of stations and observers, is inclosed.

Very respectfully, your obedient servant,

H. A. HOUSTON, *Director*.
JAS. CASSIDY, *Sergeant, Signal Corps, Assistant*.

First Lieut. H. H. C. DUNWOODY,
Acting Signal Officer, U. S. Army,
Washington, D. C.

THE RAILWAY AND FLAG SERVICE.

The object of this service is to extend, as much as possible, the benefit of the weather predictions issued by the United States Signal Service. This is accomplished through the aid of the various railway companies co-operating with the Service. These companies kindly forward the daily predictions to stations along their lines and display bulletins daily.

There being no money at the disposal of either the State or National service for the purchase of flags, those places desiring them purchase them at their own expense and receive the indications from the railway companies. The set of flags costs from $5.75 to $12, if made of bunting. They can be made of cotton at a much lower rate.

The flags are four in number, and are those derived from the system devised by Prof. P. H. Mell, jr., of Alabama, and adopted by the United States Signal Service after March 1, 1887.

No. 1, white square flag, indicates fair or clear weather; no rain.

No. 2, blue square flag, indicates rain or snow.

No. 3, black triangular flag, always refers to temperature. When placed above No. 1 or 2 it indicates warmer weather; when placed below No. 1 or 2 it indicates colder weather; when it is not displayed it indicates that the temperature will remain stationary or not vary 5° from the temperature of the same hour of the preceding day.

No. 4, white square flag with black square in the center, cold wave flag, indicates the approach of a sudden and decided fall in temperature; it is not displayed unless a temperature of 45° or less is expected. Flag No. 3 is never displayed with it.

When displayed from poles, signals should be arranged to read downward; when displayed from horizontal supports a small streamer should be attached to indicate the point from which signals are to be read.

Signals should be set as soon as possible after receiving indications, and may be withdrawn at 3 p. m.

The setting of the flags requires but a few minutes each day, and may be done by policemen, or members of fire departments, or by private enterprise.

Observers are requested to send in their reports as promptly as possible. In most cases these reports might be all received by the 5th or 6th, while at present many are not received before the 13th or 14th, thereby delaying the issue of the bulletin a week or more. It is also requested that observers will make their reports as full and complete as possible—that is, the miscellaneous data should be fully given whenever possible, such as the number of clear, cloudy, and fair days, the dates of frost, fogs, and thunder storms, etc. The cloudiness may be determined on a scale of 10. When three-tenths or less is covered, it it is clear; from 8 to 10, inclusive, it is cloudy, and the rest fair.

It is also requested that, whenever practicable, it will be reported how many of the weather indications of the Signal Service are verified and how many not.

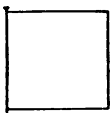
H. A. HOUSTON,
Director, Purdue University, Lafayette, Ind.

JAS. CASSIDY, *Sergeant, Signal Corps, Assistant.*

WEATHER SIGNALS

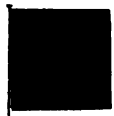
ADOPTED FOR GENERAL USE BY THE SIGNAL SERVICE ON AND AFTER MARCH 1, 1887.

No. 1.
White Flag.



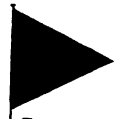
Clear or fair weather.

No. 2.
Blue Flag.



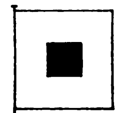
Rain or snow.

No. 3.
Black Triangular Flag.



Temperature signal.

No. 4.
White Flag with black square in centre.

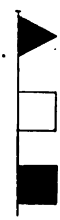


Cold wave.

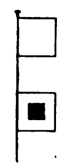
DISPLAYED FROM POLES.

Fair weather. Colder.

Warmer. Rain or snow.

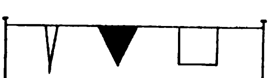


Warmer, fair weather, followed by rain or snow.

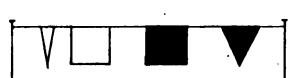


Fair weather. Cold wave.

DISPLAYED FROM HORIZONTAL SUPPORTS.



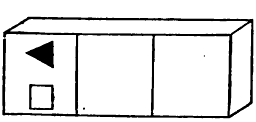
Warmer, fair weather.



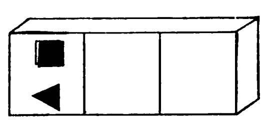
Rain or snow, followed by fair weather. Colder.

Snow and cold wave.

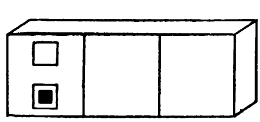
DISPLAYED ON CARS.



Warmer, fair weather.



Fair weather, followed by rain. Colder.



Fair weather. Cold wave.

[Inclosure XV.]

MINNESOTA STATE WEATHER SERVICE.

[Under the auspices of the Saint Paul Chamber of Commerce, Wm. W. Payne, Carleton College, director, co-operating with the United States Signal Service.]

SAINT PAUL, MINN., *August* 30, 1887.

SIR: I have the honor to submit the following report of the Minnesota State weather service for the year ending June 30, 1887:

During the year the service has endeavored to increase the number of stations taking observations and secure observers who were interested in the subject and entirely reliable. On June 30, 1887, there were 30 stations taking meteorological observations, while 10 others were being supplied with instruments, thus showing an increase of 20 stations for the year.

A special effort has been made to supply with indications all towns where there was a public demand for them and the display of signals would regularly be made. The people throughout the State take great interest in these signals, and many favorable comments are made upon them by the press.

On July 1, 1886, there were 35 stations displaying the signals, while a year later there were 60. The following railroads have rendered valuable assistance by sending the indications free of charge, to such places as we might select: Chicago, Milwaukee and Saint Paul Railway; Minneapolis and Saint Louis Railway; Saint Paul, Minneapolis and Manitoba Railway; Northern Pacific Railway; Saint Paul and Duluth Railway; Manitoba and Northwestern Railway. The Chicago, Saint Paul, Minneapolis and Omaha Railway, co-operated until April, 1887, when it withdrew, owing to objections made by the Western Union Telegraph Company.

During the session of the last legislature a bill was proposed for the support of this service, but it failed to become a law, owing to the adjournment of that body before the bill was reached.

The following resolution, which is an evidence of the appreciation of the service, was adopted at the Saint Paul Jobbers' Union at a regular meeting held March 12, 1887, viz:

"*Resolved*, That in the opinion of the Saint Paul Jobbers' Union, the Minnesota State weather service is a valuable institution, and a credit to the State and city, and should be sustained."

At a meeting of the perpetual members of the Saint Paul Chamber of Commerce, held March 24, 1887, it was voted to allow the State weather service the use of their present quarters until the next meeting of the legislature, as in their opinion it is a valuable institution, and should be sustained until satisfactory legislation can be secured.

I am, sir, very respectfully, your obedient servant,

E. C. BRANDENBURG,
Private, Signal Corps.

The CHIEF SIGNAL OFFICER,
Washington, D. C.

[Inclosure XVI.]

ILLINOIS WEATHER SERVICE.

No annual report of the operations of the Illinois weather service having been furnished by C. F. Mills, the director, also secretary of the State board of agriculture, an extract from the report for June, 1887, is given as evidence of the excellent work done by the service in that State.

Monthly Weather Review of the Illinois State Weather Service.

SPRINGFIELD, *June*, 1887.

[The State covers such an extended area from north to south (385 miles) that it has been found advisable to divide the same and follow the judicial divisions, which include the following territory, viz: the northern division extends from 42° 30′ to about 40° 31′; the central division extends from about 40° 31′ to about 39°; the southern division from about 39° to 36° 51′.]

INTRODUCTORY.

The month of June, 1887, was notable for its high temperature, excess of sunshine, and great deficiency of precipitation.

A drought prevailed from the 9th to the end of the month, broken only by light local showers in the northern and central divisions, from the 18th to 20th, and in the southern division on the 24th and 25th.

Showers were frequent from the 1st to 9th, the amount of rainfall during that period being more than double that of the remainder of the month. The average deficiency was 3 inches for the State, and the greatest deficiency for any section was from 4 to 5 inches for DeKalb County.

The mean temperature of the month was three degrees above the June normal, and is the highest June mean temperature recorded in the past thirteen years.

The maximum temperature, 104 degrees, was reported from the northern and southern divisions on the same date, and is the highest June maximum temperature on record.

A cool wave swept over the State on the 23d, the daily mean temperature falling gradually from 82°, on the 20th, to 63°, on the 23d, and then rose gradually to 79°, on the 30th.

Light frosts were reported on the 23d and 24th, in the low lands of the northern counties, doing little, if any, damage to crops.

A severe local dust storm was reported from the north-central counties on the 18th, and a correspondent from Montgomery County reports a regular cloud-burst on the 16th that surpassed in violence anything of the kind that has heretofore occurred in that section.

The percentage of sunshine averaged 10 per cent. above the June normal.

The prevailing direction of the wind was from the southwest, and its maxi-hourly velocity, 48 miles, from the north, on the 9th.

The average hourly movement of the wind was about 7 miles per hour.

ATMOSPHERIC PRESSURE.

No great range of atmospheric pressure occurred during the month.

The following is a summary compiled from corrected barometer readings of eleven stations:

Highest pressure, 30.40, on the 26th; lowest, 29.38, on the 4th; mean, 29.98; range, 1.02—the least range reported in any June for past six years; average range for the State, 0.56; for the Northern Division, 0.62; Central, 0.57, and Southern, 0.49.

TEMPERATURE OF THE AIR.

The mean temperature of the month for the State, 73°.4, was 3°.1 above the June normal for past thirteen years, and 1°.1 above the highest June temperature in the same period. The mean temperature of the Northern Division, 72°, was 3°.5 above the June normal for past ten years; of the Central Division, 73°.6, was 2°.1 above, and of the Southern Division, 74°.6, was 1°.8 above.

The following are the most marked departures above the June normal mean temperature, and the only departures below:

ABOVE THE NORMAL.

County.	Place.	Degree.
McHenry	Riley	2.4
Stephenson	Cedarville	2.3
Kane	Aurora	2.2
DeKalb	Sycamore	2.4
Rock Island	Davenport, Iowa	2.5
Peoria	Peoria	4.2
Knox	Oneida	3.1
Champaign	Philo	4.3
Clark	Martinsville	2.6
Crawford	Palestine	2.6
Saint Clair	Saint Louis, Mo	2.7

BELOW THE NORMAL.

Pike	Louisiana, Mo	0.1
Bond	Greenville	0.2
Madison	Collinsville	1.6
Clay	Flora	0.5
Hamilton	McLeansborough	0.6
Alexander	Cairo	0.1

The month opened with a daily mean temperature of 60° for the State, rising gradually to 75° on the 4th, remaining in the seventies until the 16th, when it rose to 80°, remaining in the eighties for five days. A cool wave swept over the State at this period, causing a fall of 19°, the daily mean temperature being 63° on the 23d, when it again commenced to rise until it attained 79° on the 30th.

The extreme monthly mean temperatures reported were 67°.3 from Chicago, Cook County, and 79°.2 from North Caledonia, Pulaski County.

Table of June maximum, minimum, and mean temperatures of Illinois for the years specified.

Temperature.	June.													
	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	Average.
Maximum	....	....	....	96	98	98	99	98	95	98	96	102	104	....
Minimum	....	....	....	44	39	43	39	39	40	45	36	40	42	....
Mean	69.1	69.9	69.8	69.3	69.9	72.3	70.5	71.5	65.4	71.1	71.0	71.3	73.4	70.3

The maximum temperature reported during the month, 104°, was 2° above the highest recorded in June for past ten years, and was reported from Oquawka, Henderson County, and Benton, Franklin County, on the 19th.

The minimum temperature, 42°, was reported from Hennepin, Putnam County, and Louisiana, Mo., Pike County, on the 24th.

RANGE OF TEMPERATURE.

The absolute range of temperature for the month was 62°, about 4° above the average June range.

The greatest monthly range reported from any section was 60° from Hennepin, Putnam County, and the greatest daily range, 44°, was also reported from that station. The least daily range, 1°, was reported from Prairieville, Lee County, on the 5th, and from Albion, Edwards County, on the 9th.

The mean daily range of temperature for the State, 19°.9, was 2°.9 above the normal for June, and 2°.7 above the highest prior June record.

The extreme mean daily ranges reported were 26°.7 from Watseka, Iroquois County, and 12°.9 from Melvin, Ford County.

The mean daily range for the Northern Division was 19°.1; for the central, 20°.7, and for the Southern, 19°.9.

Table of mean maximum and mean minimum temperatures for June, 1887.

Northern division.			Central division.			Southern division.		
Stations.	Temperature.		Stations.	Temperature.		Stations.	Temperature.	
	Mean maximum.	Mean minimum.		Mean maximum.	Mean minimum.		Mean maximum.	Mean minimum.
Woodstock	83.6	59.9	Pekin	88.1	61.8	Vandalia	86.3	66.3
Aurora	85.2	60.6	Hoopeston	84.5	61.2	Greenville	84.5	61.7
Prairieville	83.2	65.0	Philo	86.4	67.8	Collinsville	79.7	63.0
Joliet	83.8	61.6	Windsor	87.4	61.1	Flora	81.9	58.2
Geneseo	84.2	59.8				Richview	84.1	62.5
Minonk	85.6	71.5				Jordan's Grove	84.0	69.4
Watseka	85.7	58.9						

From the foregoing table it appears that the mean maximum temperature for June, 1887, was 84°.6, and the mean minimum, 63°.0; the mean of these means being 0°.4 above the monthly mean temperature.

PRECIPITATION.

The rainfall for the month was very light, the average for the State being 2.91 below the June normal for past ten years.

Rain fell generally from 1st to 9th, but from the latter date to the end of the month there was a continued drought broken only by light local showers in the northern division from 18th to 21st, and in the southern division on the 24th and 25th.

The difference in the dates of these rainfalls can be accounted for by a glance at the table of daily mean temperature. The cool wave that was general on the 23d was making itself felt in the northern part of the State as early as the evening of the 18th, and the condensation of the vapors in the atmosphere commenced with the cooling of the air.

More rain fell in the period from 1st to the 9th than double that of the remainder of the month.

The average rainfall for the northern division, 1.61, was 2.78 below the June normal for past ten years; of the central division, 1.62, was 3.36 below, and of the southern division, 2.12, was 2.55 below.

The averages for the three divisions and the State for the month are the lowest on record for June; that for the State being 1.34 below the lowest heretofore recorded (June, 1878).

The average for the months April, May, and June, 1887, 7.23, is 4.93 below the ten years normal for those months.

Table of average June precipitation for each division and the State, for the years specified.

Territory.	June.										
	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	Average.
Northern division	3.36	3.68	5.07	8.06	7.56	4.67	3.83	4.10	1.94	1.61	4.39
Central division	3.13	3.42	2.68	6.69	10.08	5.98	5.60	6.64	3.97	1.62	4.98
Southern division	2.85	4.54	3.39	4.80	5.10	6.61	5.73	6.27	5.29	2.12	4.67
The State	3.11	3.88	3.71	6.52	7.58	5.75	5.05	5.63	3.82	1.77	4.68

The greatest monthly rainfall reported was 3.78, reported from Albion, Edwards County, and the least 0.00 (no rain) was reported from Decatur, Macon County.

The following are the most marked departures below the normal rainfall for June (over three inches).

BELOW THE NORMAL.

County.	Place.	Inches.	County.	Place.	Inches.
DeKalb	Sycamore	4.62	Coles	Mattoon	3.55
Hancock	Keokuk, Iowa	3.64	Greene	White Hall	3.72
Macon	Decatur	3.20	Bond	Greenville	3.41

The following are the stations reporting one inch or more rainfall in twenty-four hours, with amounts and dates—arranged according to latitude:

Station.	Amount.	Date.	Station.	Amount.	Date.
Belvidere	1.44	June 7	Philo	1.30	June 5
Prairieville	1.25	June 7	Springfield	2.13	June 5
Joliet	1.15	June 8	Pana	1.00	June 8
Toulon	1.10	June 8	Flora	1.32	June 7
Monmouth	1.00	June 18	Irishtown	1.02	June 25
Melvin	1.30	June 1	Mascoutah	1.00	June 25
Pekin	1.05	June 6	Albion	1.20	June 1
Pekin	1.00	June 8	Albion	1.30	June 9
Hoopeston	1.10	June 5	Cairo	1.54	June 3

HAIL.

Station.	Date.	Station.	Date.
Lanark	June 18	Oneida	June 18
Flora	June 7	Atwood	June 7
Camargo	June 1		

RELATIVE HUMIDITY—PER CENT.

The mean relative humidity of the State for the month (70) was six per cent. below the June normal for past six years, and the lowest percentage of humidity on record for the month, except in 1885. The mean for the northern division was 70; central division, 70; and southern division, 69.

WIND.

The prevailing direction of the wind for the State and northern and central divisions was from the southwest; and for the southern division south.

The following is the wind data for June as reported from stations having self-registering anemometers:

Stations.	Wind—miles.				
	Total movement.	Average hourly velocity.	Maximum hourly velocity.	Direction.	Date.
	Miles.	*Miles.*	*Miles.*		
Chicago	6,600	9.0	34	W.	18
Davenport, Iowa	4,763	6.6	38	W.	18
Watseka	4,031	5.6	32	NW.	18
Keokuk, Iowa	5,205	7.2	36	SW.	3
Springfield	5,152	7.2	25	NE.	18
Windsor	4,537	6.3	48	N.	9
Saint Louis, Mo	4,864	6.8	24	S. and N.	4,21
Cairo	4,180	5.8	24	W.	9

NOTE.—The average hourly velocity is obtained by dividing the total movement by twenty-four times the number of days in the month.

DAYS CLEAR, FAIR, CLOUDY, ETC.

For the State, average number of days clear, 15; fair, 11; cloudy, 4; and 6 on which appreciable precipitation fell.

Northern division: Clear, 13; fair, 11; cloudy, 6; and 6 in which appreciable precipitation fell.

Central division: Clear, 16; fair, 10; cloudy, 4; and 5 on which appreciable precipitation fell.

Southern division: Clear, 15; fair, 11; cloudy, 4; and 7 on which appreciable precipitation fell.

This, computed according to the following formula, "considering the sun entirely obscured on a 'cloudy' day and obscured one-half the time on a 'fair' day," will approximate 68 per cent. of sunshine for the State, which is about 10 per cent. above the normal sunshine for the month; 62 per cent. for the northern division, 70 per cent. for the central, and 70 per cent. for the southern.

THUNDER STORMS.

Station.	Date.	Station.	Date.
Payson	3,7,9,20,30	Lake Forest	4,8,20
Cairo	3,6,9,21,27	Ottawa	7,18,19
Greenville	4,8	Prairieville	5,7,13,18,30
Belvidere	7	Pontiac	7
Lanark	18	Collinsville	3,4,5,6,7,8,19,20,21
Philo	1,4,6,7	Centralia	6,8,9
Pana	5,6,7,8,9	Lacon, light	1,5,7,19
Flora	7,8	Marengo	8,20
Irishtown	6,7,8	Woodstock	7,20
Mattoon	1,5,7,8,9,18,20	Peoria	5,6,8
Sycamore	5,7,18	Atwood	20,29,30
Camargo	1	Louisiana, Mo	3,6,7,17,18,20,30
Paris	1,5	Golconda	1,4,19,27
Eberle	7,8,17	Jordan's Grove	1,4,8,19,21,22
Melvin	1,7,18,19	Davenport, Iowa	13,18,20,30
Fulton	7,30	Windsor	7,8,9,18,20
White Hall	6,7,9,17	Mascoutah	1,5,6,7,21
McLeansborough	1,3,4,6,7,8,9,19,20,22	Cedarville	1,7,18,20
Geneseo	4,7,18,30	Pekin	4,5,6,8,18,19
Watseka	1,5,7,8,19,20	Richview	4,6,8
Aurora	4,19	Joliet	5,18
Kankakee	5,8	Minonk	1,3
Oneida	5,6,7,8,18,30		

ATMOSPHERIC ELECTRICITY (AURORAS).

Irishtown, on 19th; Lake Forest, on 12th; and Pekin, on 1st, 3d, 5th, and 28th.

OPTICAL PHENOMENA.

Solar halos.—Paris, on 7th; Albion, on 28th; Eberle, on 5th; Prairieville, on 17th and 25th; Marengo, on 29th and 30th; Woodstock, on 7th and 29th; Atwood, on 3d, 6th, 24th, and 28th; Springfield, on 10th and 28th, and Minonk, on 13th.

Lunar halos.—Cairo, on 2d and 30th; Mattoon, on 3d; Paris, on 7th; Albion, on 5th and 27th; Eberle, on 28th and 29th; Oneida, on 28th; Prairieville, on 1st and 26th; Marengo, on 3d and 28th; Peoria, on 3d; Atwood, on 3d; Davenport, Iowa, on 2d; Springfield, on 3d; Pekin, on 3d and 28th, and Hoopeston, on 4th, 29th, and 30th.

Parhelia.—Eberle, on 29th, and Jordan's Grove, on 2d.

Paraselenes.—North Caledonia, on 1st, 2d, 3d, and 29th.

MISCELLANEOUS PHENOMENA.

Red sunsets.—Lanark, on 18th; Flora, on 14th, 17th, and 19th; North Caledonia, on 15th; and Windsor (very brilliant and variegated), on 9th.

Meteors.—Flora, on 5th and 13th; Camargo, on 10th and 12th; Lake Forest, on 25th; North Caledonia, on 20th; and Windsor, on 16th.

Fog.—Philo, on 10th; Paris, on 1st, 2d, 9th, and 10th; Beason, light, on 6th and 10th, and dense on 9th; and Minonk, on 1st.

Sun spots.—Mr. John W. James, observer at Riley, McHenry County, reports as follows: "A very large spot came in sight on E. limb of sun late on the 5th, was on sun's meridian 11th, and disappeared, by the solar rotation, 17th; estimated diameter, 37,700 miles. A smaller spot appeared on E. limb morning of 26th."

FROST.

Sycamore, light, on 23d, 24th, and 25th; and Marengo, light, on 24th.

NEW OBSERVERS.

The department desires to secure the assistance of an observer for each county in the State. There are doubtless parties in the counties not represented in this report by observers who are giving attention to the science of meteorology. The attention of all interested in having the meteorological history of each county in the State preserved in the Monthly Weather Review of the department is invited to the importance of this work, and an earnest invitation is extended to all to aid in completing the meteorological records of the State.

The services of observers are desired in the following counties, and the residents thereof are respectfully requested to aid the department in selecting persons likely to be interested in this work: Calhoun, DeWitt, Gallatin, Jefferson, Menard, Moultrie, Schuyler, and Union.

[Inclosure XVII.]

COLORADO WEATHER SERVICE.

COLORADO METEOROLOGICAL ASSOCIATION,
Colorado Springs, Colo., September 15, 1887.

SIR: In noting the terms of your request for a report on the work of the State weather service of Colorado for the past year I observe that the time to be included in the report terminated with June, 1887. The important advantages derived from the co-operation of the director of the Harvard College Observatory are therefore not included in the present statement, though they are of such significance that at this date it is impossible to pass them without mention.

Up to June 30 the year had been marked by a moderate extension of the number of stations, and an unmistakable and therefore encouraging though slow growth of public interest in various sections of the State, while on the other hand the expense of the monthly publication proved an increasing embarrassment.

The year's work could hardly have been carried through to the end in any form but for the arrival, in April, of Mr. T. W. Sherwood, of the Signal Corps, to act as assistant. In the middle of the closing month occurred the assignment of the same gentleman to the charge of signal stations at Pike's Peak and Colorado Springs, with but one assistant—an order which, despite Mr. Sherwood's best endeavors, has since gone far to destroy the value of his earlier instructions to assist the State service. I trust that arrangements of some kind are soon to be made at your office by which the member of the Signal Corps detailed to assist the State work will escape the burden of so much and so peculiarly difficult additional duty.

There has been no one connected with this office who has had leisure for any careful study of the meteorological data thus far accumulated. By two or three observers, however, special note has been taken since January of the diurnal variation of wind in cañons to assist an investigation undertaken by Professor W. M. Davis, of Harvard College.

I am, sir, very respectfully, your obedient servant,

F. H. LOUD,
Director of Observations, Colorado Meteorological Association.

Lieut. H. H. C. DUNWOODY.

The following is given as a specimen of the monthly bulletins issued by the Colorado Meteorological Association, under the direction of Professor Loud:

Bulletin of the Colorado Meteorological Association, June 15, 1887.

In the course of the correspondence of the director of observations relative to the establishment of new stations, several instances have been noted where persons interested in the work of the association have been deterred from becoming observers by the cost of procuring instruments. The liberality of Professor Pickering, director of the observatory at Harvard College, who is in charge of the Boyden fund for astronomical work at high elevations, and who requires detailed information in respect to the meteorology of the State, in order to the most judicious application of this fund, has now put it within the power of the association to furnish a certain number of instruments. These will be loaned to individuals on condition of the association receiving regular reports of observations made with them. It is not, of course, promised to supply with instruments every one who may apply, since the need of observations from some quarters of the State is much greater than from others, but the director of observations will be very glad to hear from any one, particularly if residing in a part of the State not at present occupied by the association, who would be willing to keep carefully, expose properly, and read regularly, a thermometer and rain-gauge; and friends of the association are requested to send the names of persons of their acquaintance whom they would recommend as observers in new localities. Observers already reporting to the association who would like to extend their work, as by adding observations of the maximum or minimum thermometer, or both, will please make the fact known to the director. Barometers are not included among the instruments to be furnished, except in a very few instances of exceptional locations.

Reports from two stations appear for the first time in the present bulletin—Corinth, Las Animas County, elevation about 3,400 feet, observer W. B. McNeel; and Climax, Summit County, elevation 11,325 feet, observer Geo. C. Wortman.

THE WEATHER FOR JUNE, 1887.

As is usual during the summer season, the weather for this month is to a great degree local, different parts of the State showing diversities which do not depend upon date. Thus, at eleven stations having self-recording thermometers the maximum temperature of the month was attained at seven different dates (the 25th having, however, a majority over all others), while the minimum temperature was reached at ten different dates at different stations. As regards the relation of the temperature to the normal, the records of fifteen preceding years at Denver show fourteen Junes of lower and but one of higher temperature than that of 1887.

The rainfall shows great local diversity, particularly on the western side of the Continental divide. On the eastern slope, the southern stations generally report larger amounts than the northern; but to this statement Fort Collins is a marked exception. Beyond the State line, Kansas and Nebraska have been free this month from the comparative drought which has prevailed further east.

The special bulletin of the Signal Office presents the following for the whole country, no phenomena of meteorological importance appearing from Colorado:

"The month of June, 1887, has been remarkable for general deficiency in rainfall, absence of frosts in the northern portion of the country, and the small number of severe local destructive storms. The mean temperature for the month has been equal to or below the normal over the States bordering on the Atlantic and Gulf coasts, Tennessee, Arkansas, and Missouri. The greatest depressions below the normal were 3° at Wilmington, Jacksonville, and New Orleans; 4° at Charleston, Brownsville, and Rio Grande City, and 6° at Mobile. It is above the normal over the Lake region, the Ohio, the Missouri, and upper Mississippi valleys. The greatest differences are reported as 3° from Saint Louis, Davenport, Saint Paul, Duluth, and Deadwood; 4° from Huron, Dak., and Bismarck. There has been a general deficiency of precipitation throughout the region east of the Rocky Mountains, except in the States of Pennsylvania, New Jersey, Maryland, Kansas, Nebraska, Southern Georgia, and the southern portions of the States bordering on the Gulf of Mexico. The greatest deficiencies are reported from Tennessee, the Ohio, and upper Mississippi valleys."

Meteorological statistics for June, 1887.

	Mean barometer.		Wind.		Temperature.			
					Means at—			
	Actual pressure.	Reduced to sea-level.	Total movement.	Mean velocity.	5 a. m.	1 p. m.	8 p. m.	Monthly Mean.
Cheyenne, Wyo	24.019	29.833	7,788	10.8	53.3	74.6	64.6	64.2
Denver	24.712	29.775	5,934	8.2	56.9	79.5	71.6	69.3
Dodge City, Kans	27.348	29.904	7,648	10.6	65.0	84.0	72.9	74.0
Las Animas	25.976	29.783	5,728	8.0	61.6	83.5	72.4	72.5
Montrose	24.244	29.731	6,094	8.5	55.2	81.2	71.7	69.4
Pike's Peak	17.967	29.890	13,290	18.5	33.1	41.2	34.6	36.3
Santa Fe, N. Mex	23.298	29.854	2,228	3.1	56.8	73.8	66.1	65.6

	Extreme temperatures.				Means of daily extremes.			Humidity.		Precipitation.
	Highest.	Date.	Lowest.	Date.	Maxima.	Minima.	Maxima and minima.	Relative.	Dew point.	
Cheyenne, Wyo	90.4	25	34.0	3	78.7	50.3	64.5	46.7	39.7	0.80
Colorado Springs	89.0	18	43.0	10	79.7	50.5	65.1	48.6	43.3	1.88
Denver	95.9	25	43.7	4	83.4	54.6	69.0	43.8	43.2	0.58
Dodge City, Kans	101.7	20	55.0	1	86.1	63.0	74.6	64.1	59.4	4.00
Fort Lewis	86.0	25	32.0	14,15	79.3	46.1	62.7			1.82
Georgetown	82.5	25	38.0	3	72.9	48.5	60.7			0.35
Golden	94.0	6	48.0	3,5	82.5	57.4	70.0			
Husted	95.0	18,23	36.0	5	81.8	44.5	63.2			1.60
Idaho Springs	86.0	26	41.0	9,16	77.4	47.4	62.4			0.52
Las Animas	96.0	25	51.1	4	87.1	59.4	73.3	70.4	61.4	1.89
Montrose	62.6	21	41.0	15	85.0	52.9	69.0	30.8	32.9	0.04
Pandora	86.0	24	28.4	16	75.8	35.5	55.6			0.48
Pike's Peak	55.8	25	20.6	5	44.0	29.8	36.9	73.6	28.2	1.44
Santa Fe, N. Mex	85.5	18	48.0	10	78.2	55.5	66.8	42.7	39.4	0.60

	Mean temperature, self-registering thermometer.				
	2 a. m.	8 a. m.	2 p. m.	8 p. m.	Mean.
Colorado Springs	56.8	67.5	76.4	67.5	67.1
Pandora	40.8	55.2	69.2	51.6	54.2

Meteorological statistics for June, 1887—Continued.

	Temperature.							Monthly means.	Precipitation.
	Extremes.				Means at—				
	Highest at 2 p.m.	Date.	Lowest at 7 a.m.	Date.	7 a.m.	2 p.m.	9 p.m.	Of daily means.	
Alma	79.0	18	35.0	3	46.9	64.4*	46.9†	51.9‡	0.73
Aspen	88.0	12	34.0	4	53.3	79.5	56.7	61.5	....
Cañon City	96.0	20	54.0	8	66.6	86.1	66.9	71.6	....
Climax §	58.0	19 & 27	29.0	14	35.6	52.8	36.6	40.4	....
Colorado Springs	87.0	26	48.0	3	64.0	76.5	63.6	67.0	1.88
Corinth ‖	102.0	18	64.0	29	72.6	94.9	74.4	79.1	....
Fort Collins	96.0	....	45.0	....	....	....	....	68.1	1.96
Fort Lewis	84.0	19	45.0	15	57.6	77.2	57.2	62.1	1.82
Georgetown	77.0	19	40.5	3	53.7	88.6	57.3	59.2	0.35
Golden	90.0	19	50.0	3	61.8	78.8	68.8	69.5	....
Idaho Springs	83.0	19 & 26	44.0	3	56.6	74.7	60.1	63.4	0.52
Longmont	93.0	27	50.0	3	62.2	81.4	63.3	67.6	....
Monte Vista	88.0	25	40.0	2	54.7	76.7	55.3	60.6	0.62
Pueblo	....	....	....	....	....	....	....	....	1.30
Red Mountain	65.0	17 & 26	42.0	2, 5, 15, 16, 20	47.3	58.6	45.5	49.2	....
Saguache	86.0	25	47.0	6 & 15	56.0	77.9	58.4	62.7	1.02
Trinidad	91.9	20	41.0	3	58.1	73.8	60.2	63.0	....
T. S. Ranch ††	95.5	25	55.6	16	67.0	84.7	69.6	72.8	0.31

* For 26 days. † For 29 days. ‡ For 25 days. § For last 17 days of month.
‖ Last 18 days of month. †† T. S. Ranch is substituted for Whitewater, previous observations credited to Whitewater having been taken at T. S. Ranch, 9 miles distant.

Cloud observations for June, 1887.

Station.	7 a.m.	2 p.m.	9 p.m.	Mean.
Alma	1.7	4.6	2.8	3.0
Aspen	.6*	4.5*	4.3†	....
Cañon City	3.0	4.7	2.5	3.4
Colorado Springs	3.5	5.0	3.1	3.9
Georgetown	2.0	5.4	2.2	3.3
Golden	2.2	3.0	3.6	2.9
Husted	2.8	5.8	3.8	4.1
Idaho Springs	2.6	5.1	3.1	3.6
Longmont	3.3	5.7	4.3	4.4
Monte Vista	1.1	3.3	2.6	2.3
Pueblo‡	1.8	5.2	2.2	3.1
Saguache	1.8	3.5	3.5	2.9
Trinidad	1.6	4.9	4.3	3.6
T. S. Ranch	1.5	2.1	2.1	2.6

* For 29 days. † For 28 days. ‡ For 20 days.

METEOROLOGICAL PHENOMENA.

Thunder storms.—Alma, 11, 12; Cañon City, 1, 8, 14, 28; Colorado Springs, 8; Georgetown, 13, 26, 29; Golden, 7, 14, 23, 24, 28, 29, 30; Idaho Springs, 7, 8, 9, 11, 12, 14, 18, 23, 26, 28, 29; Longmont, 2, 4, 12, 13, 14, 29; Monte Vista, almost daily; Red Mountain, 28; T. S. Ranch, 29; Husted, 28, 29.

Hail.—Alma, 11, 12, 13, 25; Aspen, 4; Idaho Springs, 14; Longmont, 12, 13; Red Mountain, 9; Trinidad, 19, 20, 24; Husted, 29.

Frost.—Fort Lewis, 14, 15; Monte Vista, 15, 16.

Heavy wind storm.—At Aspen on the 23d; blew down signs, branches, etc.

Very destructive hail storm.—About 10 miles northeast of Longmont on the 12th.

Volunteer observers wanted in every county.

Observers are particularly requested to be prompt in sending in their records of observations, especially those which comprise the closing days of the month, in order that the bulletin may be prepared without unnecessary delay.

Observers desiring copies of Loomis's Meteorology or the American Meteorological Journal can procure the former at $1.50, or the latter (monthly) at $2.00 per annum through this office.

Correspondence in regard to observations, or to the display of weather signals, should be addressed to this office. On the subject of membership in the Colorado Meteorological Association, or of contributions to its treasury, the secretary, Dr. S. A. Fisk, may be addressed at 809 Sixteenth street, Denver.

F. H. LOUD,
Director of Observations.
T. W. SHERWOOD,
Signal Corps, U. S. A., Assistant.

COLORADO COLLEGE METEOROLOGICAL OBSERVATORY,
Colorado Springs, Colo., June, 1887.

[Inclosure XVIII.]

NORTH CAROLINA WEATHER SERVICE.

Dr. Charles W. Dabney, jr., director of the agricultural experiment station at Raleigh (and also director of the North Carolina weather service), in his biennial report to the governor of North Carolina for the two years ending January 1, 1887, refers to the State weather service as follows:

"The board of agriculture, at its July meeting, resolved, if the facilities could be obtained, to establish a fully-equipped weather station in connection with the experiment station. They found that a great deal of the work of such a station was being done at the farm already, and that the full duties of a weather station could be easily discharged by its existing agencies with some help, which it was expected could be obtained from the Chief Signal Officer of the Army.

"The Commissioner of Agriculture was instructed to lay the petition of the board for assistance before the Chief Signal Officer, and the director of the station was instructed to organize the weather station as soon the necessary means were obtained.

"General W. B. Hazen, the Chief Signal Officer, gave a prompt and favorable reply to the petition of the board and promised them the assistance of an experienced weather observer, the equipment of one full signal station, with a supply of blanks, forms, etc.

"The weather station started operations at the experiment farm on the 1st of December. The meteorological work, formerly conducted at the farm, included studies of the air and soil temperatures, the moisture in the soil, and a record of sunshine. To this has now been added the regular work of a full signal station.

"As soon as it was ascertained that a weather station could be had at the farm, the question arose, why not extend the benefits of a weather service to all portions of the State, or to as many of its people as can be reached with reasonable promptness by telegraph and by mail?

"As this is a comparatively new enterprise, some explanations of its workings and results will be in place. A State weather service has a twofold duty: First. The collection of accurate, detailed weather statistics for the territory of a State; and second, the dissemination of practical information, weather "indications," and frost or cold-wave warnings.

"Success in the profession of farming is more dependent upon the weather than upon anything else. Farmers are, as a class, more interested in the weather than any other men, and forecasts of the weather for twenty-four or forty-eight hours ahead will determine the commonest every-day operations on the farm.

"Besides these ordinary benefits, which everybody will appreciate, North Carolina has unusually large interests in crops which frost and freezes can destroy, and which may be saved if only a half a day's warning of cold is given. Our tobacco, truck, and fruit interests have been frequently damaged, or destroyed to the extent of from one-fourth to one-half of the whole, by sudden frosts or freezes, of which our farmers had no warnings.

"It would seem eminently appropriate that the agricultural department of the State should undertake to collect these statistics and to give out this important information. Through the agency of the agricultural experiment station the department has undertaken this work, and intends to push it just as far as the facilities of communication will permit.

"Some of the immediate benefits of the State weather service may only be briefly touched upon here.

"(1). It will bring the benefits of the weather "indications," storm warnings, flood warnings, "farmer's bulletins," etc., of the United States Signal Office, to bear directly upon the interests and daily lives of a great many of our people. If the system is carried

out, as we desire it shall be, after a sufficient time for organization and experience, it will bring the knowledge of an expected cold wave, for example, twelve hours in advance of the cold wave, to all the people of the State who are within six hours' time, by the ordinary means of communication, of one of our branch signal stations. We have already 31 State signal stations, fully equipped with flags, besides 2 United States signal stations (Wilmington and Charlotte) and 134 partially equipped, making a total of 167 places in this State which now receive the daily and special weather warnings.

"We desire to have such a fully equipped signal station at all telegraph stations 6 miles and over apart. This is what we are striving to obtain; but it is evident that it will take a considerable time and a very general assistance from the public at large, the towns, the railroad and telegraph companies, before this can be accomplished.

"At present all the railroads in the State are co-operating with the State in the extension of this work. The managers and superintendents of railroads operating in North Carolina were, without exception, prompt to appreciate the advantages which would follow to their lines and their patrons from the distribution and publication of the weather warnings. The railroad lines named below receive the weather and temperature and cold-wave warnings from our signal service, and use them on their account and for the benefit of their business. Besides the general benefits to traffic of all kinds and the great, though indirect, benefits to the railroads, resulting from the benefits to agriculture, they have found the warnings of material advantage in shipping perishable freight, in loading flat-cars, in dispatching their trains, and in many other ways.

"For their intelligent appreciation of this matter, and for their public spirit in co-operating with us, the State weather service is under great obligations to the gentlemen named below in connection with the railroads:

"The Seaboard Air-Line system, comprising the Raleigh and Gaston division, Raleigh and Augusta division, and the Carolina Central division, with 44 stations, Maj. John C. Winder, general manager; the Piedmont Air-Line system, Mr. E. B. Thomas, general manager, Washington, comprising the Richmond and Danville division, with 15 stations, Mr. W. H. Green, superintendent, Richmond; the North Carolina division, with 14 stations, Col. A. B. Andrews, superintendent, Raleigh; the Western North Carolina division, with 25 stations, Maj. V. E. McBee, superintendent, Asheville; the Charlotte and Columbia division, 4 stations, Col. T. R. Talcott, superintendent, Columbia, S. C.; the Atlanta and Charlotte Air-Line, 3 stations, Col. Edmund Berkeley, superintendent, Atlanta, Ga.; the Atlantic and North Carolina Railroad, with 6 stations, Mr. Washington Bryan, president, New Berne, N. C.; the Atlantic Coast Line and branches, with 32 stations, Mr. H. Walters, general manager, and Mr. J. R. Kenly, superintendent transportation, Wilmington, N. C.; the Cape Fear and Yadkin Valley Railroad, with 16 stations, Col. Julius A. Gray, president, and Maj. J. W. Fry, superintendent, Greensborough, N. C.; the Norfolk Southern Railroad, with 3 stations, Mr. M. K. King, president, Norfolk, Va.; the Tarboro, Greenville, and Washington Telegraph Company, with 2 stations, Mr. W. E. Fountain, manager, Tarborough. This is a total of 165 stations in North Carolina reached by means of these lines.

"(2) The weather service will be the means of securing a much better knowledge of the meteorology of our State, which will be valuable in more ways than can be named here.

"(3) It will give the people of all parts of the State reliable standards for temperature, rainfall, humidity, wind-velocity, etc., which are sources of varied, useful information.

"(4) It will put within the reach of local agricultural clubs and individual farmers the means of accurate observations upon the relations of the weather to our crops. Without a weather record in figures, our conceptions of what the weather was during any particular season are sure to be very unreliable.

"(5) It will educate the people at large on the subjects in science which have the most important bearing upon their interests, comfort, and lives.

"Wherever possible, we are connecting the local observing stations with schools, so that their teachers and pupils may be induced to form habits of observing these interesting natural phenomena.

"As the State weather service is a purely voluntary association, without available funds for the purchase of meteorological instruments, we find it necessary to appeal to the generosity and public spirit of representative citizens in each town and community where we hope to establish a local observing station. Agreeable to our expectations, and much to the credit of the friends of the service, these appeals have met with prompt and ready responses in nearly every case.

"In carrying out this part of the work we have established and will have regularly at work on the 1st of January twenty-five State observing stations fully equipped and three partially equipped, scattered all over the State.

"The fully equipped costs from $25 to $30. This marked and early success is an encouraging testimonial to the public spirit of our citizens and the best evidence of the interest taken in this subject.

"All the United States signal observers within or near the borders of our territory have been ordered by the Chief Signal Officer to co-operate with us in this work, and eleven stations have already commenced to transmit monthly copies of their meteorological reports to us.

"We shall also receive reports from a number of cotton-belt observers in North Carolina and the adjacent States. These observers make special observations during the growing season of the cotton crop.

"With the stations already established and equipped, we will have thirty-nine observers reporting to us in January next. The meteorological reports from all stations comprising the North Carolina weather service, and these corresponding stations, will be consolidated, verified, and corrected at this office, and printed in one general report each month in the Bulletin of the Department of Agriculture."

[Inclosure XIX.]

NEW YORK WEATHER SERVICE.

CORNELL UNIVERSITY, *Ithaca, N. Y.*, *August* 14, 1887.

DEAR SIR: In answer to your letter of August 9, I have to say that being out of town, where I shall return about the middle of September next, I am unable to send a copy of the State weather-service bill to which you refer. I will do so upon my arrival at the University. I may say, however, that the bill in question contemplated the establishment of a central office at the Cornell University, and, if possible, the organization of observing offices in every county of the State, enlisting the co-operation of the State railways. A yearly appropriation was asked for from the State treasury of $4,000, for the purchase of instruments, printing reports, experiments, and maintenance of the equipment of the service. The appointment of two commissioners by the governor and a State director, to serve without compensation. These officers to make an annual report of the condition of the service, audit bills, and render account of disbursements to comptroller, or any other officer that the governor may designate. The object of the State service being to co-operate with the United States Signal Service for the collection of meteorological data; and to disseminate, for the benefit of the agricultural and commercial interests of this State, all information likely to serve their ends, adding to the prosperity of the State and the advancement of meteorological science in its relations to climate, weather predictions, and other scientific and economic bearings of the subject. These were the main features of the bill, which I think would have passed both branches of the legislature without opposition; but before the bill was perfected, circumstances beyond my control obliged me to suspend all work upon it; and the bill was not pushed because I was unable to find time to answer the questions of the representative in charge of the bill; till finally I felt it necessary to request him to allow the matter to rest over until next year. I anticipate no difficulty then. I am well aware of the necessity of such a service as the bill anticipated in the State, and I thank you most sincerely for your kind and repeated offers of aid. I will gladly do all I can to obtain such aid from the State as would place its weather service upon a footing proportional to the importance of its wealth and import in the nation; therefore I shall be ready to accept your proffered aid, enlist the sympathy of the University authorities, upon which I think I can rely, and do all in my power to co-operate with your office and render all the service within my reach.

Very respectfully, your obedient servant,

E. A. FUERTES.

H. H. C. DUNWOODY,
Acting Signal Officer and Assistant.

[Inclosure XX.]

EXECUTIVE OFFICE WESTERN UNION TELEGRAPH COMPANY,
New York, *June* 16, 1887.

DEAR SIR: Referring to our recent correspondence relative to the use of our lines for State weather service, and to the interview which I had the pleasure of having with you at my office on the same subject day before yesterday:

After further consideration, I think that the fairest proposition that the Western Union Telegraph Company can make for this service is as follows:

(1) The number of officers or individuals served with the report in each State shall be lumped together.

(2) For the first twenty-five of such officers or individuals served, the Western Union Telegraph Company shall be paid for each, one-half of the Government rate.

(3) For all such reports over twenty-five and under one hundred, the Western Union Telegraph Company shall be paid one-third of the Government rate each.

(4) For all such reports over one hundred, the Western Union Telegraph Company shall be paid one-quarter of the Government rate each.

(5) These charges for the transmission of these reports shall not include the delivery of the reports, but only their transmission to the respective stations.

(6) The necessary arrangements for the transmission of these reports to be made by your office, or by the State bureaus, as you may prefer, and payment for their transmission to be made in the same way.

I am quite convinced that this will be more than fair to the public desiring these reports, as the individual charge will really be a nominal one. The Western Union Telegraph Company is, however, willing to make this concession, as a matter of public spirit, in view of the fact that the payment for the service, although nearly nominal, defines and sustains its rights under its contracts with the various railroad companies, which have hitherto been violated by the misapprehension of the local weather bureaus.

If the figures given above meet with your approval, we shall be under many obligations if you will kindly inform the State bureaus concerning them, and advise us when and through what channels you desire to have the service commenced and the statements made.

Yours, very truly,

THOS. T. ECKERT,
Vice-President and General Manager.

General A. W. GREELY,
Chief Signal Officer, Washington, D. C.

[Inclosure XXI.]

Number of messages authorized to be sent by each State service under the special agreement with the Western Union Telegraph Company previously referred to.

State.	Number of messages.	State.	Number of messages.
Alabama	100	Mississippi	35
Arkansas	25	Missouri	25
Colorado	10	Nebraska	35
Illinois	75	North Carolina	100
Indiana	75	Ohio	50
Kansas	25	South Carolina	60
Michigan	25	Tennessee	50
Minnesota	100		

[Inclosure XXII.]

List of railroads and number of stations on each, receiving weather indications through the co-operation of State weather services, prior to March 4, 1887.

Road.	No. of stations.	Road.	No. of stations.
SOUTH CAROLINA.		ALABAMA—continued.	
Atlanta and Charlotte Air Line	12	Selma and Montgomery and Western R. R	18
Port Royal and Augusta R. R	19	Cincinnati, Selma and Mobile R. R	5
Charleston and Savannah Rwy	9	East Tennessee, Virginia and Georgia R. R	18
South Carolina Rwy	15	Pensacola and Selma R. R	5
Richmond and Danville R. R. in South Carolina	40	Alabama and Great Southern R. R	20
Total number of stations in South Carolina	95	Memphis and Charleston R. R	8
ALABAMA.		East Alabama and Cincinnati R. R	2
South and North R. R	23	Georgia Pacific R. R	8
Mobile and Gerard R. R	5	Mobile and Ohio R. R	8
Montgomery and Eufaula R. R	7	Northeastern of Georgia	....
Mobile and Montgomery R. R	14	Total number of stations in Alabama	159

List of railroads and number of stations on each, receiving weather indications, etc.—**Cont'd.**

Road.	No. of stations.
NORTH CAROLINA.	
Seaboard Air Line system, comprising Raleigh and Gaston, Raleigh and Augusta, and Carolina Central	43
Atlantic Coast Line R. R.	33
Cape Fear and Yadkin Valley R. R.	16
South Carolina, Columbia and Greenville Division	3
Atlantic and North Carolina R. R.	6
Norfolk and Southern R. R.	6
Richmond and Danville R. R. and North Carolina R. R.	17
Western North Carolina R. R.	38
Total number of stations in North Carolina	162
KANSAS.	
Union Pacific R. R.	5
B. and M. R. R.	1
Missouri and Pacific R. R.	1
Atchison, Topeka and Santa Fé R. R.	*
Total number of stations in Kansas, independent of the Atchison, Topeka and Santa Fe	7
NEBRASKA.	
Burlington and Missouri River R. R.	29
Missouri Pacific R. R.	2
Union Pacific R. R.	2
Fremont and Elkhorn Valley R. R.	2
Total number of stations in Nebraska	45
INDIANA.	
Indianapolis, Decatur and Springfield R. R.	23
Indianapolis and Vincennes R. R.	6
The Cincinnati, Indianapolis, St. Louis and Chicago (Big 4) R. R.	30
Cleveland, Columbus, Cincinnati and Indianapolis Bee Line	32
Total number of stations in Indiana	91
MISSISSIPPI.	
Mobile and Ohio R. R.	25
Natchez, Jackson and Columbus R. R.	9
Mississippi and Tennessee R. R.	9
Illinois Central R. R.	38
Total number of stations in Mississippi	81
ILLINOIS.	
Chicago and Alton R. R.	74
Chicago and Iowa R. R.	19
Chicago and St. Louis R. R.	25
Cincinnati, Indianapolis, St. Louis and Chicago R. R.	17
Illinois Midland R. R.	29
Louisville, Evansville and St. Louis R. R.	8
Lake Erie and Western R. R.	14
ILLINOIS—continued.	
Mobile and Ohio R. R.	16
Ohio and Mississippi R. R.	22
Springfield Division	27
Peoria, Decatur and Evansville R. R.	28
Rock Island and Peoria R. R.	8
St. Louis and Central Illinois R. R.	3
Toledo, Peoria and Western R. R.	42
Indiana, Illinois and Iowa R. R.	8
Central Iowa R. R.	17
Fulton County Narrow Gauge R. R.	7
Cairo, Vincennes and Chicago R. R.	32
Chicago, Milwaukee and St. Paul R. R.	22
Indiana, Bloomington and Western R. R.	18
Total number of stations in Illinois	222
MINNESOTA.	
Chicago, Milwaukee and St. Paul R. R.	31
St. Paul, Minneapolis and Manitoba R. R.	10
Minneapolis and Saint Louis Rwy	9
Also stations on the Chicago, Minneapolis; St. Paul and Omaha; the Chicago, Burlington and Northern; St. Paul and Duluth; the Northern Pacific; Wisconsin Central; and Minneapolis and St. Marie R. R., all waiting for the indications	200
Total number of stations in Minnesota	250
ARKANSAS.	
St. Louis and Iron Mountain and Southern; and Arkansas Valley R. R., Missouri Pacific system	23
Batesville and Brinkley R. R	3
Memphis and Little Rock R. R.	4
St. Louis and San Francisco R. R.	....
Total number of stations in Arkansas, independent of those on the St. Louis and San Francisco R. R.	30
MICHIGAN.	
Port Huron and Northwestern R. R.	5
Detroit, Lansing and Western R. R.	21
Chicago and West Michigan R. R.	33
Pontiac, Oxford and Port Austin R. R.	11
Toledo, Ann Arbor and West Michigan R. R.	18
Flint and Pere Marquette R. R.	17
Total number of stations in Michigan	105
MISSOURI.	
Wabash system in Missouri, Michigan, Ohio, Indiana, and Illinois	58
Total number of stations for all States	1,286

* To all stations.

In addition to these all principal roads in Tennessee, New Jersey, Ohio, Pennsylvania, New York, and New England will distribute the indications to selected stations.

[Inclosure XXIII.]

Copies of weather-crop bulletin dispatches received at the Chief Signal Office from State weather services, August 13, 1887.

OXFORD, MISS., *August* 13, 1887.

CHIEF SIGNAL OFFICER, *Washington, D. C.:*

Cotton worm has appeared all over State. Cotton opening; crop continues good.

WRIGHT.

RALEIGH, N. C., *August* 13, 1887.

SIGNALS, *Washington, D. C.:*

Weather favorable to all crops.

BALDWIN.

PHILADELPHIA, PA., *August* 13, 1887.

SIGNALS, *Washington:*

Weather conditions reported favorable for all growing crops.

TOWNSEND.

NEW BRUNSWICK, *August* 13, 1887.

SIGNALS, *Washington:*

Corn reports show very favorably. Corn and truck peaches rotton; trees and truck injured by plant lice.

MCGANN, *Sergeant.*

LITTLE ROCK, ARK., *August* 13, 1887.

SIGNALS, *Washington, D. C.:*

Rains southeast affected crops favorably. Remainder suffering from drought. Cotton shedding squares and bales. Rain needed.

SIMONS.

AUBURN, ALA., *August* 13, 1887.

SIGNALS, *Washington City:*

Average temperature for State, 76°; one highest, 99°; lowest, 62°; average rainfall, .96 inches; rainy days, 2; favorable change in weather. Corn generally good, and made cotton turning yellow and shedding on sandy lands. Cotton worms doing some damage.

MELL.

COLUMBIA, S. C., *August* 13, 1887.

SIGNALS, *Washington, D. C.:*

First part unfavorable; last part favorable to corn and cotton; rainfall above; temperature and sunshine about average.

GRAHAM.

CRETE, NEBR., *August* 13, 1887.

CHIEF SIGNAL OFFICER, *Washington, D. C.:*

Temperature above average; rainfall below; affecting corn injuriously. Hay crop short.

BURNLEY.

COLUMBUS, OHIO, *August* 13, 1887.

SIGNALS, *Washington:*

Generally dry and hot. Potato, corn, and tobacco crops affected injuriously. Rain too late to benefit.

STRONG, *Private.*

TOPEKA, KANS., *August* 13, 1887.

SIGNALS, *Washington:*

Light rainfall; high temperature. Corn beyond help, hay, potatoes and other crops light.

JENNINGS.

SPRINGFIELD, ILL., *August* 13, 1887.

CHIEF SIGNAL OFFICER, *Washington, D. C.:*

Local showers; arrived too late to make marked improvement in crops. Majority of sections suffering from drouth. Temperature and sunshine above.

KERKAM.

ST. LOUIS, MO., *August* 13, 1887.

SIGNALS, *Washington:*

Temperature and sunshine nearly normal; rainfall below; badly distributed; unfavorable to crops in most sections.

WEBER, *Sergeant.*

BOSTON, MASS., *August* 13, 1887.

SIGNALS, *Washington:*

Rainfalll normal except New Hampshire; Vermont above; temperature normal; frost; no injury to hay, and corn mostly harvested.

OSWELL.

LANSING, MICH., *August* 13, 1887.

SIGNALS, *Washington:*

Drouth broken on the 10th, and corn and potato crop favorably affected. Temperature and sunshine above normal.

CONGER.

SAINT PAUL, MINN., *August* 13, 1887.

CHIEF SIGNAL OFFICER, *Washington:*

Conditions very favorable for crops. Harvest delayed slightly account rain. Commenced harvesting wheat Saint Vincent.

BRANDENBURG.

INDIANAPOLIS, IND., *August* 13, 1887.

SIGNALS, *Washington:*

Temperature and sunshine normal; rain below. Late showers beneficial, but unevenly distributed; much more needed.

CASSIDY.

NASHVILLE, TENN., *August* 13, 1887.

SIGNALS, *Washington:*

Rainfall below; temperature and sunshine above. Crops suffering in many localities. Good rains along Tennessee River.

BATE, *Private.*

Inclosures numbers XXIV to XXVII, inclusive, relate to the Weather Crop Bulletin, which was issued weekly during the crop season, the first bulletin appearing May 8, 1887.

[Inclosure XXIV.]

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, May 3, 1887.

The Chief Signal Officer, being convinced that the data collected in this office may be greatly utilized by those interested in the production of the staple crops, has decided to issue, beginning with Saturday, May 8, 1887, a special bulletin, with the view of placing before the public each Monday morning reliable information relative to the climatic conditions which have existed the previous week in the agricultural districts of the country.

Sufficient information has been collected from Signal Service stations for the determination of quite accurate normal values of temperature and rainfall, and as the growth of all staple crops depends so largely upon the amount of heat and moisture and their relations to one another, it is believed that these bulletins, containing the deficiencies or excesses relative to temperatures and rainfall during the growing season, will serve as a reliable basis for determining the conditions favorable or unfavorable for the growing crop.

When this information is compared with corresponding data of previous years, it will serve those specially interested in calculating the probabilities or expectations of the coming season and the influence of the same on the growing crops. These bulletins will contain departures from normal temperatures and rainfall in the agricultural districts of the country for the current week (to which special attention is invited), and also the departures from the normal temperature and rainfall from January 1 to the date of the bulletin.

The reports which are collected daily by telegraph will be charted and summarized at the close of each week and the results given to the press associations, as items of

news, in time for publication in the Monday morning papers. These bulletins will designate the agricultural regions over which the meteorological conditions are favorable to the crop productions; will point out regions where the conditions observed during the current week have alleviated spells of drought and excessive heat, or ameliorated conditions of excessive moisture or prolonged cold, and the limits of late or damaging frosts. The modifying effects of such meteorological conditions upon the season can be reasonably conjectured by parties interested, especially as the bulletin will state whether the season is tending to increase or decrease the excesses or deficiencies of temperature and rainfall.

While it is recognized that temperature and rainfall are not the only meteorological elements which influence crop production, they are, for most crops, by far the most important, and serve to indicate the general character of the season, whether favorable or unfavorable. It is proposed to add to these elements, as soon as practicable, records of average cloudiness for each week of the growing season, from which the duration of sunshine may be closely approximated. It appears important that statistics of this character should be published for the benefit of all interested in the staple crops of the country, and while the bulletin must be general in its nature, owing to the limited number of stations from which reports are received, it will increase in value each season with increase of stations, and will ultimately place in the hands of the general public, as well as the farmers and dealers, facts which will serve to indicate several weeks in advance the probable yield, and, therefore, the probable value of the various crops.

Signal Service observers located at the principal commercial centers will be supplied with this bulletin weekly, and, in addition, with carefully prepared tables containing the detailed data at various stations, in order to furnish them to such commercial organizations as may desire to receive them. This new and experimental feature of Signal Service work is at present attended by no other expense than that of a small clerical force employed in tabulating reports which are already collected for the general "indications" work of the Service. If, after trial, this bulletin is found to meet the wants of those interested in crop productions, more detailed reports will be furnished covering special localities and applicable to special crops.

The Chief Signal Officer, in expressing his desire to extend the usefulness of this service, will be pleased to receive suggestions from those interested in the bulletin, with a view to improving the same, either as to the character of the information furnished or as to the form in which the reports are presented.

A. W. GREELY,
Chief Signal Officer.

[Inclosure XXV.]

[Form No. 122*g*—1887.]

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY.

Weather-crop report.

Please state the effect of the weather on crops in your section during the last seven days; and, if possible, furnish, as provided for below, data as to rainfall.

NOTE.—Please erase such italicized words (*above, below, about, very favorably, etc.*,) as are not applicable to the conditions of the week.

Station ——, (Date) ——, 1887.

Rainfall.—The rainfall for the last seven days is apparently *above below about* the average, and has been *well fairly badly* distributed, and has affected the —— crop *very favorably very injuriously.*

Temperature.—The temperature for the last seven days is apparently *above below about* the average, and has affected the —— crop *very favorably very injuriously.*

Sunshine.—The past seven days have given *very much very little average* amount of sunshine, and has affected the —— crop *very favorably very injuriously.*

REMARKS.

(Signature) ——.

Rainfall —— inch — on —— days.

[Inclosure XXVI.]

WAR DEPARTMENT, SIGNAL SERVICE, U. S. ARMY,
Washington City, August 21, 1887.

Weather conditions of wheat, cotton, corn, and tobacco districts, for the benefit of agricultural and commercial interests, for the week ending Saturday, August 20, 1887.

Districts and stations.	Departure from normal temperature and rainfall.							
	For past seven days.				From January 1 to August 20, 232 days.			
	Mean temperature.		Rainfall.		Mean temperature.		Rainfall.	
	Excess.	Deficiency.	Excess.	Deficiency.	Excess.	Deficiency.	Excess.	Deficiency.
New England States.	° F.	° F.	Inches.	Inches.	° F.	° F.	Inches.	Inches.
Eastport, Me	5		.12			27	3.27	
Portland, Me		2	1.33			525	7.28	
Boston, Mass	1			.40	0	0		6.66
Block Island, R. I	7			.65	106			2.86
Middle Atlantic States.								
Albany, N. Y		4		.31	96			1.06
New York City	4			.79		227	5.36	
Philadelphia, Pa		6		.64	257		1.06	
Atlantic City, N. J	0	0		.65	142			3.75
Baltimore, Md		15	.02			109	2.46	
Washington City		9		.70	112			5.91
Lynchburg, Va	7		.95			157		1.32
Norfolk, Va		6	.56			128		2.32
South Atlantic States.								
Charlotte, N. C	7		.08			42		7.32
Hatteras, N. C	17			.37	183			14.62
Wilmington, N. C	16			1.00		52	.45	
Charleston, S. C	17			1.71		268		9.23
Augusta, Ga	18		1.11			105		1.82
Savannah, Ga	23			1.82		420		5.32
Jacksonville, Fla	12			.05		340	7.04	
Florida Peninsula.								
Key West, Fla		2		1.09				
Cedar Keys, Fla	25			1.46	29			3.10
Gulf States.								
Atlanta, Ga	21		.10		129			2.22
Pensacola, Fla	18			1.36	82			9.64
Mobile, Ala		1		1.42		71		7.13
Montgomery, Ala	14			.53	140			7.69
Vicksburg, Miss	10			.66	224			15.53
New Orleans, La		10		1.01		108	1.21	
Shreveport, La	7			.41	301			12.72
Fort Smith, Ark	1		1.27		326			3.36
Little Rock, Ark	10			.60	147			13.43
Corpus Christi, Tex	0	0		.78	33			12.33
Galveston, Tex	1			.58	15			7.56
Palestine, Tex	22			.40	280			9.28
San Antonio, Tex	13		.27		56			11.53
Brownsville, Tex		5		.88		278	5.39	
Rio Grande City, Tex	19			.84	118		2.61	
Ohio Valley and Tennessee.								
Chattanooga, Tenn	21		.02		253			3.75
Memphis, Tenn	11			.16	339			10.26
Nashville, Tenn	11		.56		211			4.23
Knoxville, Tenn	13			.57	543			4.96
Louisville, Ky	14		1.00		457			2.65
Indianapolis, Ind		9	.97		191			8.92
Cincinnati, Ohio	8		.41		168			.20
Columbus, Ohio	2		.00	.00	430			4.10
Pittsburg, Pa	6			.07	668		11.72	
Lake Region.								
Buffalo, N. Y		7		.09	338			2.82
Oswego, N. Y		19	.52			255		7.59
Rochester, N. Y		9		.24	118			12.28
Erie, Pa		14	.64		23		3.25	
Cleveland, Ohio		13	1.87		338		.14	
Sandusky, Ohio		8		.15		1		1.68
Toledo, Ohio		13		.29		79		1.88

[Inclosure XXVI—Continued.]

Districts and stations.	Departure from normal temperature and rainfall.							
	For past seven days.				From January 1 to August 20, 232 days.			
	Mean temperature.		Rainfall.		Mean temperature.		Rainfall.	
	Excess.	Deficiency.	Excess.	Deficiency.	Excess.	Deficiency.	Excess.	Deficiency.
Lake Region—Continued.	° *F.*	° *F.*	*Inches.*	*Inches.*	° *F.*	° *F.*	*Inches.*	*Inches.*
Detroit, Mich		24	.23		390			5.46
Alpena, Mich		19		.84	254			1.10
Escanaba, Mich		19		.97		126		7.18
Grand Haven, Mich		18	.08		4			4.04
Mackinaw City, Mich		15		.60	103			12.38
Marquette, Mich		26		.42		455		2.24
Port Huron, Mich		10		.39	295			6.11
Chicago, Ill		24	.64		11			8.16
Milwaukee, Wis		22	.45		15			3.46
Duluth, Minn		11		.52		684		4.26
Upper Mississippi Valley.								
Saint Paul, Minn		32		.39		247		2.20
La Crosse, Wis		46	.30			71		11.87
Davenport, Iowa		13		.68	132			5.76
Des Moines, Iowa		7	.34		182			10.64
Keokuk, Iowa		10	.34		169			7.44
Cairo, Ill	12		.13		248			13.66
Springfield, Ill	9		.16		456			11.75
Saint Louis, Mo	28			.40	937			2.38
Missouri Valley.								
Lamar, Mo	0	0		.59	507			3.67
Leavenworth, Kans		16	.92		84			3.08
Valentine, Nebr		1	.31			152	1.30	
Omaha, Nebr		10		.06		85		12.74
Huron, Dak		48		.03		61	3.15	
Yankton, Dak		20	1.31		37			5.26
Extreme Northwest.								
Moorhead, Minn		18		.28	136			1.93
Saint Vincent, Minn		27		.31		71	2.14	
Bismarck, Dak		2		.22		309		2.55
Totten, Fort, Dak	3			.21		128	1.51	
Buford, Fort, Dak	0	0	.17					
Rocky Mountain Slope.								
Custer, Fort, Mont	16		.16			44		1.79
Helena, Mont	37			.21	4		.44	
Deadwood, Dak		9		.05	165		3.27	
Cheyenne, Wyo		15		.21				
North Platte, Nebr	4		.07		208			2.02
Denver, Colo		2		.27	481			3.16
Las Animas, Colo		8		.08	442		50	
Dodge City, Kans	8			.02	347			2.52
Concordia, Kans	14			.12	419			2.34
Elliott, Fort, Tex	11			.28	854		1.17	
Sill, Fort, Ind. T.	24			.37	452			3.70
Abilene, Tex	22			.07	295			3.42
Davis, Fort, Tex	23			.61	313			5.55
Interior Plateaus.								
El Paso, Tex	14			.18	158			4.07
Salt Lake City, Utah	18			.15	427			2.72
Pacific Coast.								
Olympia, Wash		12		.14				
Roseburg, Oregon		18		.07		111	2.78	
Portland, Oregon		19		.10		189	5.66	
San Francisco, Cal		2	.00	.00		259		.57
Red Bluff, Cal		2	.00	.00	157			14.39
Sacramento, Cal		19	.04			90		3.95
Los Angeles, Cal		5	.00	.00	178			.49
San Diego, Cal		21		.07	4			.36

A. W. GREELY,
Chief Signal Officer.

[Inclosure XXVII.]

Weather crop bulletin, No. 16, for week ending August 20, 1887.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, August 21, 1887.

TEMPERATURE.

During the week ending August 20 it has been slightly warmer than usual throughout the Southern States and the Ohio Valley, and cooler than usual throughout the lake region and the upper Mississippi and Missouri valleys, the average daily temperature in the last named district ranging from 2° to 4° below the normal. In New England, the middle Atlantic States, and on the Pacific coast the temperature differed but slightly from the normal.

The daily average temperature for the season, from January 1 to August 20, has ranged from 1° to 2° above the normal in the central valleys, and it has been slightly cooler than usual at stations on the Atlantic and Pacific coasts, and from Lake Superior westward to Montana.

RAINFALL.

During the week the rainfall has been in excess generally throughout the corn and tobacco regions and the northeast portion of the cotton region and in northern New England, while there has been less than the usual amount of rain in the lower Mississippi Valley, on the middle and south Atlantic coast, in Arkansas and the southern portions of Missouri and Kansas, and from Lake Superior westward to Dakota. Well distributed rains have occurred throughout the drought region, and the 7 a. m. reports this morning show that rain continues in this section. The large deficiency in the rainfall for the season, ranging from 5 to 15 inches in the Mississippi Valley, has been slightly reduced in the Northern States and augmented in the Southern States during the past week, the only sections reporting an excess of rainfall for the season being northern New England, central portions of the middle Atlantic States, southern Dakota, and the north Pacific coast.

GENERAL REMARKS.

The weather for the week has been favorable throughout the corn-belt, the recent rains having greatly improved the condition of that crop, but owing to the lateness of the rains in the principal corn-producing States, the yield will probably be below the average. In the cotton region from Alabama westward to Texas the weather for the week has improved the crop conditions, and the cotton harvest is progressing, but more rain would benefit the crop in the central portions of Arkansas. In North and South Carolina an excess of rainfall for the week is reported as unfavorable for the cotton crop.

The weather has been generally favorable for all crops in Kentucky, Tennessee, Virginia, and in the middle Atlantic and New England States. In Minnesota the uncut crops were improved and harvested crops damaged by rains.

A. W. GREELY,
Chief Signal Officer.

LIST OF INCLOSURES.

I. Report of the director of State weather service of Pennsylvania, with copy and bill organizing the State service, and report of the Franklin Institute relative to same. (4560 Sig. '87.)
II. Report of the director of the South Carolina weather service. (4561 Sig. '87.)
Report of the director of the Missouri weather service. (4187 Sig. '87.)
. Report of the director of the Tennessee weather service. (4565 Sig. '87.)
V. Report of the director of the Kansas weather service. (4567 Sig. '87.)
VI. Report on work of the New England Meteorological Society. (4411 Sig. '87.)
VII. Report of the director of the Mississippi weather service. (4564 Sig. '87.)
VIII. Report of the director of the New Jersey weather service. (4672 Sig. '87.)
IX. Report of the director of the Ohio Meterological bureau. (6046 Sig. '87.)
X. Report of the director of the Michigan weather service. (8366 Obs. '87.)

XI. Report of the director of the Alabama weather service. (8365 Obs. '87.)
XII. Report of the director of the Nebraska weather service. (6043 Sig. '87.)
XIII. Report of the director of the Arkansas weather service. (8367 Obs. '87.)
XIV. Report of the director of the Indiana weather service. (6044 Sig. '87.)
XV. Report of the director of the Minnesota weather service. (7664 Obs. '87.)
XVI. Monthly weather review of the Illinois State weather service for June, 1887.
XVII. Report of the director of the Colorado Meteorological Association with the monthly bulletin for June, 1887. (6045 Sig.'87.)
XVIII. Report of the director of the North Carolina weather service.
XIX. Letter by Prof. E. A. Fuertes, of Cornell University, Ithaca, N. Y., relative to the organization of a weather service in New York. (5320 Sig. 87.)
XX. Copy of letter of June 16, 1887, by Thomas T. Eckert, vice-president Western Union Telegraph Company, to the Chief Signal Officer, giving the arrangements under which weather forecasts are distributed to State weather services by the Western Union Company. (3924 Sig. '87.)
XXI. List showing the number of messages authorized to be sent by each State service.
XXII. List of railroads and number of stations on each receiving weather indications through the co-operation of State weather services, prior to March 4, 1887.
XXIII. Copies of weather-crop bulletin dispatches received at the office of the Chief Signal Officer from State weather services, August 13, 1887.
XXIV. Copy of circular-letter issued May 3, 1887, giving notice of the publication of the weekly weather crop bulletin.
XXV. Copy (specimen) of blank form, No. 122-G., used by observers of State weather services for reporting the effects of the weather on crops.
XXVI. Copy (specimen) of form No. 177, issued August 21, 1887, giving weekly and seasonal temperature and rainfall comparisons.
XXVII. Copy (specimen) of weather crop bulletin issued August 21, 1887.

APPENDIX No. 6.

REPORT ON RIVERS AND FLOOD WARNINGS.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, May 3, 1887.

SIR: I have the honor to state that river and flood reports from regular Signal Service stations have been received through the year, and reports were received from special river stations until discontinued by your direction on March 5, 1887, as a result of insufficiency of the appropriation for telegraphing.

The regular Signal Service stations alone send river reports regularly to this office, the special river stations reporting by telegraph to Washington only in times of dangerous rises and then only those called for.

The predictions made at this office as to the condition of the rivers are often indefinite and uncertain, and must necessarily be so, as the information given by the small number of reports received is not sufficient to enable the indications officer to make the predictions more specific.

Thus it is that river men and others interested in the changes of the river are left to draw their own conclusions from reports furnished them.

These reports are eargerly looked for, and river men attest their value. They are equally as valuable in periods of low water as during floods.

River reports are more valuable in the interests of navigation during low water, and to owners of property liable to damage by floods during high water.

The following comparison of the different tributaries of the Mississippi during the flood of 1882 is made to show their relative capacity and the relation between the amount of rainfall and the actual drainage of the different rivers.

In the report of the Mississippi River Commission for 1883, the actual discharge per second at Grafton, Ill., of the Upper Mississippi is calculated for every day in the year of 1882; while at Paducah, Ky., Columbus, Ky., Helena, Ark., Red River Landing, and at a point near the head of the Atchafalaya, the discharge per second was measured at frequent intervals. From these discharge observations, by interpolating, the annual discharge of water past these places may be determined with considerable accuracy.

Thus it was found that the discharge during 1882 was, at

	Cubic feet.
Grafton, Ill	6, 172, 500, 000, 000
Paducah, Ky	12, 846, 600, 000, 000
Columbus, Ky	21, 670, 600, 000, 000
Helena, Ark	23, 426, 900, 000, 000
Red River Landing, La	23, 059, 300, 000, 000
Atchafalaya	3, 428, 400, 000, 000

If to the discharge at Grafton the discharge at Paducah be added, and the sum subtracted from the discharge at Columbus, the remainder will represent the discharge of the Missouri River, provided there was no overflow into the St. Francis River bottom above Columbus, 6,172,500,000,000+12,846,600,000,000=19,019,100,000,000; 21,670,-600,000,000—19,019,100,000,000=2,651,500,000,000=the discharge of the Missouri River.

This can not be far from the correct discharge, as the overflow into the St. Francis River bottom must have been slight, as shown by the gauge-readings at Memphis and Helena, where the maximum height was attained at both places on the same days; whereas, if the overflow had been considerable, the river would have continued to rise at Helena after having attained the maximum height at Memphis.

If from the discharge at Helena we subtract the discharge at Columbus, the remainder will represent the discharge of the St. Francis River, 23,426,900,000,000—21,670,600,-0C0,000=1,756,300,000,000.

The sum of the discharges of the Red River Landing and the discharge at the head of the Atchafalaya will give the total discharge of the Mississippi and its tributaries, and if from this sum the discharge at Helena be subtracted, the remainder will be the combined discharge of the White, Arkansas, Yazoo, and Red Rivers—23,059,300,000,000+3,428,400,000,000=26,487,700,000,000—23,426,900,000,000=3,060,800,000,000.

The total downfall of the rain in the Mississippi Valley may be found by grouping the stations at which a record of the rainfall was kept so as to represent equal areas as nearly as possible.

Station.	Rainfall in 1882.
	Inches.
Fort Assinaboine	12.76
Fort Benton	10.18
Helena	10.32
Fort Custer	12.05
Average	11.43
Fort Buford	12.73
Fort Custer	12.05
Deadwood	33.83
Average	19.54
Saint Vincent	22.48
Bismarck	21.33
Fort Bennett	17.80
Moorhead	34.01
Average	23.90
Deadwood	33.83
Cheyenne	8.64
Denver	14.49
Average	18.99
Fort Bennett	17.80
Huron	28.12
Yankton	20.63
North Platte	17.95
Average	21.12
Saint Paul	23.14
Yankton	20.63
Omaha	37.68
Des Moines	47.60
Keokuk	41.54
Average	34.12
La Crosse	27.93
Dubuque	32.84
Davenport	36.60
Keokuk	41.54
Springfield	58.21
Chicago	41.34
Milwaukee	28.43
Average	38.13
Dodge City	13.14
Fort Supply	25.57
Fort Elliott	24.76
Fort Sill	31.13
Average	23.65

Station.	Rainfall in 1882.
	Inches.
Leavenworth	25.97
Springfield, Mo	47.24
Fort Smith	....
Little Rock	75.54
Average	49.58
Springfield	58.21
Saint Louis	43.15
Cairo	61.58
Memphis	71.05
Little Rock	75.54
Nashville	63.45
Average	62.16
Nashville	63.45
Chattanooga	61.96
Knoxville	66.36
Louisville	56.50
Cincinnati	52.12
Indianapolis	53.68
Columbus	51.30
Decatur, Ala	56.81
Average	57.77
Memphis	71.05
Helena	80.40
Little Rock	75.54
Vicksburg	71.56
Shreveport	65.11
New Orleans	50.18
Average	68.97
Pittsburg	38.63
New Geneva	49.05
Confluence	54.62
Marietta	61.39
Freeport	45.20
Oil City	48.55
Erie	46.37
Cleveland	39.98
Sandusky	42.53
Toledo	33.03
Duluth	38.02
Moorhead	34.01
Average	44.28
Average for Mississippi Valley	36.43

RAINFALL IN THE OHIO BASIN.

Evansville	51.32
Cairo	61.58
Decatur	56.81
Nashville	63.45
Indianapolis	53.68
Average	57.37
Indianapolis	53.68
Louisville	56.50
Chattanooga	61.96
Knoxville	66.36
Cincinnati	52.12
Columbus	51.30
Sandusky	42.53
Average	54.92

Marietta	61.39
Cleveland	39.98
Erie	46.87
Freeport	45.20
Oil City	48.55
Pittsburg	38.63
New Geneva	49.05
Confluence	54.62
Average	47.97
Average for Ohio Basin	53.42

RAINFALL IN SAINT FRANCIS BASIN.

Station.	Rainfall in 1882.	Station.	Rainfall in 1882.
	Inches.		*Inches.*
Memphis	71.05	Little Rock	75.54
Cairo	61.58		
Helena	80.40	Average for Saint Francis Basin	74.64

RAINFALL IN THE UPPER MISSISSIPPI BASIN.

Moorhead	34.01	Keokuk	41.54
Duluth	38.02	Davenport	36.60
Saint Paul	23.14	Chicago	41.34
		Springfield	58.21
Average	31.72	Saint Louis	43.15
La Crosse	27.93	Average	44.17
Des Moines	47.60		
Dubuque	32.84	Average for Upper Mississippi Basin	36.70
Milwaukee	28.43		
Average	34.20		

RAINFALL IN MISSOURI BASIN.

Fort Assinaboine	12.76	Moorhead	34.01
Fort Shaw	14.21		
Fort Benton	10.18	Average	23.90
Helena	10.32		
Fort Custer	12.05	Deadwood	33.83
		Cheyenne	8.64
Average	11.90		
		Average	21.23
Fort Buford	12.73		
Fort Custer	12.05	Denver	14.49
Deadwood	33.83	Leavenworth	25.97
		Saint Louis	43.15
Average	19.54	Omaha	37.68
Saint Vincent	22.48	Average	30.32
Bismarck	21.33		
Fort Bennett	17.80	Average for Missouri Basin	21.38

RAINFALL IN THE ARKANSAS AND RED RIVER BASINS.

Santa Fé	11.37	Shreveport	65.11
Denver	14.49	Vicksburg	71.56
		Little Rock	75.54
Average	12.93	Helena	80.40
Fort Elliott	24.76	Average	73.15
Fort Supply	25.57		
Dodge City	13.14	Little Rock	75.54
		Springfield, Mo	47.24
Average	21.16		
		Average	61.39
Fort Sill	31.13		
		Average for Arkansas and Red River Basins	44.14
Average	31.13		
Shreveport	65.11		
Average	65.11		

Average for the Kansas and Red River basins, 44.14.

The percentage of rainfall drained off, then, is:

For the entire Mississippi basin (cubic feet): $\frac{26,487,700,000,000}{105,082,600,000,000}=.25$.

For the Ohio basin (cubic feet): $\frac{12,846,600,000,000}{26,548,600,000,000}=.48$.

For the Upper Mississippi basin (cubic feet): $\frac{6,172,500,000,000}{14,417,000,000,000}=.43$.

For the Missouri basin (cubic feet): $\frac{2,651,500,000,000}{25,715,000,000,000}=.10$.

For the St. Francis basin (cubic feet): $\frac{1,756,300,000,000}{1,820,700,000,000}=.91$.

For the Arkansas, White, Yazoo, and Red River basins (cubic feet):

$$\frac{3,060,800,000,000}{30,762,400,000,000}=.10.$$

Of the above results 25 per cent. for the entire Mississippi basin, 48 per cent. for the Ohio basin, and 43 per cent. for the Upper Mississippi basin are very nearly correct, as the discharges for these streams are considered as accurately determined. The drainage in the Missouri basin must have been small in comparison with the amount of rainfall, still 10 per cent. is an uncertain value, as it was assumed there was no overflow from the Mississippi into the St. Francis River basin. For the St. Francis River basin 91 per cent. is probably a little too large, as in the discharge of that river there was included the discharge of all the small tributaries which empty into the Mississippi between Columbus, Ky., and Helena, Ark., as well as any overflow from the Mississippi which may have occurred above Columbus, Ky.

For the Arkansas and Red Rivers 10 per cent. must be a little too large, as with the discharge from these rivers was included the discharge from White and Yazoo Rivers, small tributaries which discharge a very large proportion of their rainfall, the Yazoo being similar to the St. Francis.

A number of causes may change the proportion of drainage to rainfall.

The greater the rainfall the greater will be the percentage of that rainfall drained away, as only a certain amount of moisture can be taken up or absorbed by the ground and evaporated, and the remainder must be drained away. Anything which will change the absorptive power of the ground or the evaporative power of the atmosphere must change the relation between rainfall and drainage. In the winter time the ground, being usually frozen, will absorb little of the rain which falls upon it, or of the snow and ice when they melt. The capacity of the atmosphere for moisture also is less, and not so much of precipitation is lost in this manner. In summer the ground will absorb large quantities of moisture, which it loses rapidly by evaporation, and is thus ready to absorb more moisture from the next rainfall. Grouping the stations in the Ohio basin where observations of rainfall were taken, as they were grouped before, the amount of precipitation in the first three months of 1882 can be determined.

Stations.	Inches.	Stations.	Inches.
Evansville	11.40	Marietta	19.61
Cairo	20.71	Cleveland	9.12
Decatur	25.81	Erie	11.39
Nashville	32.50	Freeport	13.48
Indianapolis	17.13	Oil City	11.86
		Pittsburg	11.50
Average	21.51	New Geneva	18.22
		Confluence	20.77
Indianapolis	17.13		
Louisville	21.83	Average	14.49
Chattanooga	26.54	General average	19.09
Knoxville	27.43		
Cincinnati	19.23		
Columbus	15.39		
Average	21.26		

The percentage of precipitation drained away is

$$\text{(cubic feet): } \frac{7,420,631,408,000}{9,485,904,384,000}=.78.$$

The discharge at Paducah for January, February, and March being 7,420,631,408,000 cubic feet, and the total downfall in the Ohio basin for January, February, and March being 9,485,904,384,000 cubic feet. The largest amount of precipitation was in January, next largest in February, and next largest in March, while the greatest discharge was in February.

The precipitation of December, 1881, is about equal to the precipitation of March, 1882, but owing to the different conditions of temperature prevailing in December and in March the amount of water due to the precipitation in December which passed Paducah in January is greater than the amount of water due to precipitation in March which passed Paducah in April. Therefore 78 per cent. must be a little too great.

The discharge in October, November, and December is less than for any other three months of the year, and the rainfall also is least. The discharge of the Ohio in these three months was 724,005,475,200 cubic feet, and the downfall in the Ohio basin was 4,295,-503,872,000 cubic feet; or the percentage of precipitation drained away is:

$$\text{(cubic feet): } \frac{724,005,475,200}{4,295,503,872,000} = .17.$$

This is not quite large enough, as more of the precipitation which fell in September was drained away in October than of the precipitation which fell in December and was drained away in January.

The flood of 1884, the greatest that ever occurred on the Ohio River, was caused in the following manner: During the month of January, 1884, the temperature throughout the Ohio basin was below the freezing point, excepting one or two days between the 11th and 14th, when the temperature was at most stations about 10 degrees above freezing point, and the last three or four days of the month, when the temperature rose from 20 to 30 degrees above the freezing point. The precipitation during the month was almost altogether in the form of snow and was at—

Stations.	Inches.	Stations.	Inches.
Freeport, Pa	6.23	Cincinnati, Ohio	2.21
Pittsburg, Pa	4.82	Chattanooga, Tenn	5.88
New Geneva, Pa	5.14	Louisville, Ky	1.94
Confluence, Pa	4.07	Indianapolis, Ind	1.05
Columbus, Ohio	2.25	Nashville, Tenn	7.20
Knoxville, Tenn	6.66	Cairo, Ill	2.32

By far the greater part of this precipitation remained upon the ground until near the end of the month. The river was at a medium stage on January 1, but fell rapidly to a very low stage on account of the extremely cold weather which prevailed for the first week.

The slight rise above the freezing point from the 11th to 14th caused a slight rise in the river throughout its entire length from Pittsburg to Cairo. This rise soon subsided, the river falling to as low a stage as before. When the temperature rose at the end of January the river began rapidly rising from Pittsburg to Evansville, and at all places on the same day, though very little rainfall occurred at any place in the river basin, showing that the rise was entirely due to melted snow and ice. On February 4 the river had fallen 9.4 feet at Pittsburg, 3 feet at Marietta, and had almost ceased rising at Cincinnati, and was still rising at points below Cincinnati when heavy rains began, continuing almost uninterruptedly until February 14. The rainfall from February 4 to 14, inclusive, was, at Pittsburg, 3.44 inches; Cincinnati, 6.82 inches; and Louisville, 8.02 inches; and the river channel being already filled, this rainfall caused the flood-wave to rise to an unprecedented height.

To successfully predict the extent of the rise and fall of different rivers an accurate knowledge of temperature and precipitation and numerous reported gauge-readings along the main rivers and larger tributaries are necessary. In addition to those already in existence, special river stations are to be established at the following points as soon as river-gauges can be constructed and observers appointed: Hinton, W. Va.; Portsmouth, Ohio; Zanesville, Ohio; Manhattan, Kans.; Sioux City, Iowa; Louisa, Ky.; Catlettsburgh, Ky.; Madison, Ark.; Columbus, Nebr.; Frankfort, Ky.; Charleston, W. Va.; Gallipolis, Ohio; Circleville, Ohio; Falmouth, Ky.

The different stages of the principal rivers for every day of the years 1883, 1884, 1885, and 1886 have been charted, together with the mean stage for a number of years, including 1886, which are at the disposal of the officer making river predictions. More

accurate conclusions as to the extent of floods could be reached if rain-gauges were placed at points near the headwaters of the different tributaries of the main stream. Observers at these rainfall stations should keep a regular record of the precipitation, taking the observation at 2 p. m., seventy-fifth meridian time, daily. A copy of this record should be mailed weekly to the river-stations center, and a copy mailed weekly to the Chief Signal Officer. If the rainfall in one day exceeds 1 inch it should be telegraphed to the river center and posted with the river bulletin. These telegrams should be consolidated and telegraphed to the Chief Signal Officer with the 3 p. m report.

By comparison of the river-gauge heights reached in the lower portions of the streams, caused by the precipitation near their headwaters, it would take but a short time to make a close estimate as to what amount of rainfall would cause a dangerous rise. Of course, all conditions existing, such as whether the ground is frozen or not, whether saturated by previous rains or dry, whether the precipitation is in the form of rain or snow, should be taken into consideration and allowance made in each case.

In addition to the rain-gauges, each tributary stream whose volume is sufficient to affect the main stream should have at least two river-gauges erected thereon, one at or near the mouth, and another sufficiently far up-stream to give timely warning of a coming rise. In the case of the longest streams whose volume is alone sufficient to affect the main stream there should be more river-gauges. This arrangement would not immediately allow of certain predictions, but each high water would furnish additional data upon which to base predictions, thereby increasing the facilities of the service for furnishing information, and in a short time giving to the public almost certain predictions in each high water.

In the Ohio River system there is at present a lack of stations on the Ohio River between Marietta and Cincinnati, there being a stretch of 295 miles of river, in which distance some of the largest tributaries enter both from the north and from the south where there is not a single station. Pittsburg and Knoxville are the only regular Signal-Service stations in the Appalachian chain of mountains which report rainfall to the Chief Signal Officer. These two stations being widely separated, give but little idea of the amount of rainfall in these mountains. The large number of storms which pass from the west eastward by being elevated in passing over these mountains are caused to precipitate large quantities of rain. In order to benefit navigation in times of low water, as well as to successfully predict high waters, it is necessary to know the amount of precipitation at all times as nearly as possible. I would, therefore, recommend the establishment of a number of rain-gauges on the headwaters of all the streams that rise in the mountains and flow westward. It is believed that this could be done at little expense, say 10 cents a day for each station.

In addition to these special rainfall stations, the regular Signal-Service stations in Ohio and Indiana should be instructed to send the precipitation weekly by mail, or by telegraph in case of heavy rains, to the station centers. This would, in my opinion, give the Ohio River a complete river service. The Ohio, next to the Lower Mississippi, is the most important navigable river. The Ohio also plays a more important part in the floods of the Lower Mississippi than does any other stream, as is evident from the fact that frequently wave crests can be followed from Pittsburg to New Orleans, which is rarely the case with the Upper Mississippi or the Missouri Rivers. I have selected 22 places, distributed through the basin of the Ohio near the headwaters of the tributaries, with the exception of the Big Sandy and Licking, where rainfall stations can not be established on account of the absence of telegraph lines.

The Upper Mississippi is pretty well supplied with river stations, and thirteen stations are recommended as rainfall stations for this river.

River stations, situated as follows: Tuscumbia, on the Osage; Manhattan, on the Kansas, or on the Platte; Sioux City, on the Missouri, are recommended to be established. Five rainfall stations distributed near the headwaters of the different tributaries are recommended to be established for the Missouri River.

A river station at Madison, Ark., would be of importance in high waters to interests on the Lower Mississippi, and the establishment of this station is recommended.

The following are the special rainfall stations recommended to be established:

Rainfall stations.

Name of station, county, and State.	Name of river for which rain-gauge readings are to be taken.
Glenville, Gilmer County, W. Va	Little Kanawha.
Buckhannon, Upshur County, W. Va	Monongahela.
White Sulphur Springs, Greenbrier County, W. Va	Greenbrier and Great Kanawha.
Christiansburgh, Montgomery County, Va	New.
Abingdon, Washington County, Va	Tennessee.
Asheville, Buncombe County, N. C	French Broad.
Charleston, Swain County, N. C	Little Tennessee.
Murphy, Cherokee County, N. C	Tennessee.
Rogersville, Hawkins County, Tenn	Holston.
Bowling Green, Warren County, Ky	Green.
Williamsburgh, Whitley County, Ky	Cumberland.
Greensburgh, Green County, Ky	Green.
Kenton, Hardin County, Ohio	Scioto.
Sidney, Shelby County, Ohio	Little Miami.
Canton, Stark County, Ohio	Muskingum.
Wooster, Wayne County, Ohio	Muskingum.
Mansfield, Richland County, Ohio	Scioto.
Caledonia, Marion County, Ohio	Scioto.
Rushville, Rush County, Ind	South Fork White.
Huntington, Huntington County, Ind	Wabash.
Terre Haute, Vigo County, Ind	Wabash.
Logansport, Cass County, Ind	Wabash.
Lafayette, Tippecanoe County, Ind	Wabash.
Ottawa, La Salle County, Ill	Illinois.
Cedar Rapids, Linn County, Iowa	Cedar.
Oberlin, Decatur County, Kans	Republican.
Saline, Saline County, Kans	Kansas.
Kirwin, Phillips County, Kans	Solomon.
Wallace, Wallace County, Kans	Smoky Hill.
Fort Ripley Station, Crow Wing County, Minn	Mississippi.
Alexandria, Douglas County, Minn	Mississippi and Minnesota.
Fergus Falls, Otter Tail County, Minn	Minnesota.
Ortonville, Big Stone County, Minn	Minnesota.
Redwood Falls, Redwood County, Minn	Minnesota.
Tracy, Lyon County, Minn	Minnesota.
Rhinelander, Oneida County, Wis	Wisconsin.
Portage City, Columbia County, Wis	Wisconsin.
Phillips, Price County, Wis	Chippewa.
Chippewa Falls, Chippewa County, Wis	Chippewa.
Culbertson, Hitchcock County, Nebr	Republican.
Valentine, Cherry County, Nebr	Niobrara.
Tulsa, Creek Nation, Ind. T	Arkansas.
Eufaula, Creek Nation, Ind. T	Canadian.
Springer, Colfax County, N. Mex	Canadian.
Walcot, Carbon County, Wyo	North Platte.

FRANK W. ELLIS,
Second Lieutenant, Signal Corps, U. S. Army.

THE CHIEF SIGNAL OFFICER.

APPENDIX No. 7.

REPORT OF STATIONS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, June 30, 1887.

SIR: I have the honor to submit the following report on the work performed by the stations division at this office in connection with the full reporting stations of the service in charge of regularly enlisted observers, and also in connection with the supervision of the system of special river, special display, special cotton-region, and special rainfall stations, at which civilian observers are employed and paid a small compensation for their services.

The various branches of the service under the direction of this division have, by the exercise of the strictest economy, been continued without exception, and each has continued to grow in popularity and in usefulness to the general public.

The duties of the several subdivisions have been systematized and revised so as to make it possible for the work on hand, which has greatly increased during the year, to be fully and faithfully performed with the force employed. Such changes as were considered necessary in the interests of economy have been made, and many short methods with due regard to accuracy have been adopted.

Following is a statement of some of the routine work performed:

Estimates of supplies required at stations during the ensuing fiscal year are prepared. A careful watch is kept, month by month, over each item of the several appropriations to see that recommendations or expenditures are not made in excess of the funds allotted. Bids for all articles for station use are examined and proper action taken. To secure uniformity all stations have upon recommendation of this division been furnished during the year with a standard rain-gauge of 1885 for use as the station gauge. It has been my endeavor for the past eighteen months to provide all stations with good serviceable patterns of roof instruments and the standard roof shelters, and during the past year 35 roof or sod instrument shelters, of the standard pattern, have been erected at places where the necessity for better exposure was evident. In all 120 stations of the second order have, up to date, been furnished with standard shelters, leaving 30 yet to be furnished, which latter number I propose to furnish during the coming fiscal year. An improved pattern of anemometer support has been devised by Private D. T. Maring of this division and about 18 stations now have it in use. As the appropriations will admit, these supports will be introduced at other stations during the coming fiscal year; and a new and improved pattern of wind-vane, with a good standard, as well also as improved patterns of rain and snow gauges, will be introduced as far as possible at all stations.

A revise of the instructions to observers has been prepared and is now at the printer's. The new edition will probably be ready for issue early in the coming year.

Instructions for rainfall observers, in pamphlet form, have been prepared for issue to the special rainfall observers and to the observers in charge of the central stations who control them; also appropriate forms upon which to make weekly and monthly reports.

Complete records are kept of all instruments at regular stations, and whenever an instrument becomes unserviceable prompt action is taken to have it called in and replaced by a serviceable one, unless the necessary repairs can be made at the station without expense to the United States.

In books prepared for the purpose a full record of all the transactions at stations have been kept; one for miscellaneous matters having any relation to the work of this service; one for the railroads at whose stations the weather symbols are displayed; one showing in detail the names of corporations, persons, or places, receiving maps, bulletins, press reports, and other publications issued at the stations; one showing the rank, station, dates of assignment and relief, of enlisted men belonging to the Signal Corps; one for record of stationery and supplies issued to clerks in the division, for use in performing their official duties; one for the record of the special cotton-region stations and matters relating thereto; one for the system of special river stations, with a complete history of each; one for the system of special rainfall stations recently inaugurated; one for a detailed record of the errors made by observers in preparing their meteorological reports;

one containing a complete record of the cold-wave stations, and other information relating thereto; one giving the names and times of arrival and departure of all visitors to the Signal Office between 4 p. m. and 9 a m., and on Sundays and holidays; one in which is noted the times of arrival and departure of observers traveling from and to this office and between stations, under orders; book containing samples of all meteorological forms; office directory, in which is noted, monthly, the address of every person attached to the office; check books showing the receipt of meteorological forms from stations. Missing reports are promptly called for.

In this division all entries in the original records of observations, and the monthly and annual meteorological reports from stations, are examined for errors, and all sums, averages, means, and barometric reductions are recomputed and verified. The dew-point and relative humidity, for each observation, are also verified. After the examination has been completed each month, error sheets are prepared in letter form calling attention to all errors and discrepancies detected, which are forwarded to the various observers with directions to properly correct their station records and then return the error letters for file. During the year there have been examined, compared, computed, and corrected, 1,845 original records, and the same number of monthly meteorological reports. One hundred and forty-nine annual meteorological reports in triplicate have been acted on in a similar manner, and 1,994 error letters have been made out and mailed to observers for the correction of their retained files of records. In addition to the foregoing, 29 annual meteorological reports have been compiled for stations from which, for various reasons, the observers failed to forward them. One hundred and nine thousand seven hundred and seventy-two anemometer record sheets and 2,777 monthly wind-signal reports have been examined and corrections made where necessary. Eight hundred and fifty letters were written to observers in connection with the errors found in the foregoing anemometer record sheets and wind-signal reports.

The duties of the Washington station are performed by observers in this division, and all the work incident to a full reporting station is carried out. The day observers are on duty from 7.30 a. m. to 4 p. m., the evening observers from 4 p. m. to 11 p. m., and the night observers from 11 p. m. to 7. 30 a. m.

Since the abandonment of Fort Myer a large number of new men have been given practical instruction in taking observations and in the other duties of an observer on station, and at one time the class contained as many as seven men.

Since May 3, 1887, hourly readings of the barometer have been taken. From 4 p. m. to 9 a. m., and on Sundays and holidays, the office buildings are under charge of the observer of the stations division on duty, who has a watchman under his orders. Every precaution is taken to guard the Government property and buildings against theft and fire.

Up to March 10, 1887, the duties of preparing meteorological data, making copies of the original records and other meteorological reports of the Signal Service for use of other bureaus of the Government, for boards of trade, chambers of commerce, cotton exchanges, railroad companies, for the Mississippi River Commission, for use in court, for publication, and for many other public purposes, devolved upon this division. On March 10, 1887, a records division was organized and the records at this office, accumulated since the establishment of the service in 1870, were turned over to that division, together with the duties of preparing meteorological records, etc., as stated above. Four of the clerks were transferred to the new division with the records.

Much more could have been done to enlarge and increase the various special systems of stations, but owing to the limited amount appropriated by Congress, it became a question, early in the year, whether the stations already in operation could be maintained till June 30.

Among the duties devolving upon the stations division may be enumerated those of making up, each year, the estimates of the appropriations for the various classes of stations or work over which the division has control; keeping accurately informed month by month of the condition of the separate items under each appropriation expended under the direction of the stations officer, in order that such changes may be made as will keep the monthly expenditure within its proportion of the amount allotted for the year.

As a rule, models of all meteorological forms originate in the stations division, and all reprints are sent here for revision and correction before a new edition is issued. This year arrangements have been perfected by which all the present manifold bulletins and reports which have never given that satisfaction which this service aimed at, will, after the supply on hand has been used, be replaced by plain white paper bulletins issued by the cyclostyle process, a process which seems well adapted for such purpose.

At about 30 of the larger stations the a. m. tri-daily manifold bulletins have been discontinued, and their places supplied by a weather map showing the atmospheric conditions at all stations at 7 a. m. of the day of issue. This map meets with full favor from the business community, and its meaning is more easily grasped by persons who are in-

terested in, and base their business to a certain extent upon, the weather conditions as shown by the Signal Service reports. The midnight bulletin and 3 p. m. bulletin are still issued at a number of stations, but it is intended, at an early date, to make other important changes for placing the weather observations before the people in yet more satisfactory shape. It is hoped that, during the coming year, the Chief Signal Officer will be able to further enlarge the issue of the weather map by substituting it for the bulletin at all stations at which, from the number of reports they receive by telegraph from other stations, the observers will be able to draw satisfactory isobars and isotherms.

Special reports of the rivers, the rainfall over cotton areas, etc., are mailed monthly to officers of the United States Engineers on special duty in connection with the navigation of our river system.

On March 16, 1887, the Chief Signal Officer instituted a new, and what has proved to be a very well received feature of the service, by issuing each Sunday a bulletin giving the condition of the growing crops, and asking for suggestions either as to the character of the information to be furnished, or as to the form in which the reports should be presented to the press and to the people.

From the many flattering letters from parties who receive the crop bulletins it is evident that they meet a long felt want. The first week about 200 bulletins were sent out, but since then the edition has been increased by observers asking for additional copies and by individual requests to have names added to the list until the number now issued approximates 400 copies, and it is anticipated that a further increase will soon be necessary.

In connection with this crop bulletin another weekly report is issued showing the excess or deficiency of temperature and precipitation at each of the stations of the service as compared with the normal of each since the station was established. These bulletins show the departures as regards temperature and rainfall since January 1, 1887, and also for the preceding seven days. This information gives a fair indication to the farmer, merchant, and all interested in agriculture, of the forwardness of the season, and upon the data thus published predictions as to the staple yield of the most important cereals may, in a measure, be based.

Through the medium of the Associated Press, other press associations, and the efforts of the observers at the principal Signal Service stations to whom copies are regularly mailed, these bulletins are given wide publicity, and, it is believed, will eventually become a very important factor in determining in advance the probable yield of the cotton, wheat, corn, tobacco, and other crops.

The system of river observations at specially selected stations has continued during the year with good results. When floods are expected, and dangerous rises in the navigable rivers occur, these observations are telegraphed to designated points below at which regular stations of this service are in operation, where they are tabulated and the information forwarded to all points liable to be affected injuriously by high water.

During the last half of the year an inspector has been out selecting eligible sites for additional locations from which these observations would be of practical value to river interests, and, as a result, stations have been opened at Rockwood and Columbia, Tenn.; Eddyville, Catlettsburgh, Louisa, Falmouth and Frankfort, Ky.; Laredo, Tex.; Zanesville, Gallipolis, Circleville, and Portsmouth, Ohio; Charleston and Hinton, W. Va., and Madison, Ark. At the places named observers have been appointed, river-gauges built, rain-gauges and wind-vanes placed in position and all the necessary equipments furnished. The observers have been carefully instructed, and all of the new stations are now in successful working order. The additional information these reports furnish constitutes a very important addition to that from points previously selected.

In order to properly maintain these new river stations and keep within the limit of the appropriation, it became necessary to close the following, which were found to be those whose observations were of the least value: Leadvale, Tenn., Lexington, Mo., and Umatilla, Oregon.

Mr. H. W. Brewer, employed as river expert, visited a large number of river stations, and reported upon the relative value to the public of each. At all places visited the river-gauges were put in complete order, their zeros redetermined, all action taken to have the stations in the best possible order and to make the observations of the fullest value to the public. Mr. Brewer was discharged on January 15, 1887, the appropriation having reached that stage where it was found impossible to continue his compensation. Much valuable data were accumulated for future use in connection with the river and flood system by Mr. Brewer during his inspections.

On account of the small balance of the appropriations available for the purpose, the telegraphing of the daily reports from the stations in the Cairo and Pittsburg sections, and the reporting by telegraph of sudden and dangerous floods from other river stations, were of necessity discontinued on March 4, 1887. Much dissatisfaction was expressed at this action, but as it became necessary to keep the expense within the amount authorized, no remedy could be applied.

At present there are 69 paid special river stations in operation.

As an adjunct to the river service a system of rainfall stations is in contemplation, to go into effect on July 1, and all arrangements have been made for them to begin observations on that date. These stations have been distributed at suitable points on the great water-sheds, at the sources and at suitable points on the principal tributaries of the larger rivers. They will be furnished with rain-gauges and will report weekly by mail, and, in cases of excessive rainfall, by telegraph, to the designated regular Signal Service station) and the information they furnish will be promptly disseminated throughout the area of country liable to be affected.

The observations at rainfall stations will consist in measuring and reporting the amount of rain which has fallen during the preceding twenty-four hours, as above outlined.

Rainfall stations will be arranged in sections, and each section center (a regular Signal Service station) will receivet he reports from several of the stations and distribute the information so as to subserve the best interests of the public. Forty-three of these stations have already been located, and if it is found that the appropriation will admit of the expense, others will be established at such other points as may seem best for the public good.

Observations at the special stations in the cotton region were taken from July 1 to October 31, 1886, and from May 1 to June 30 this year. As the appropriation was insufficient to take the observations during the whole of the season considered necessary, from April 1 to October 31, it was thought best to begin one month later rather than have to discontinue the service during June, when the cotton crop is in a condition liable to be unfavorably affected by an excess or deficiency of rainfall.

While double the number of stations could have been established with advantage to the cotton interests, still nothing could be done in this direction owing to the fact that the money available for the work was barely sufficient, with the utmost economy, to carry the observations up to June 30, at the places already taking them.

During the suspension of the cotton observations, from November 1 to May 1, many of the observers were kind enough to continue the observations for the use of their several State weather services, and thus a number of observers have an unbroken record, which it is believed will be of much value in the future.

One hundred and thirty-two special cotton region stations were in operation during the entire season. For obvious reasons no new ones were opened, and observations were discontinued as unnecessary at Fernandina and Waldo, Fla. Unless more liberal provision is made by Congress for the cotton service—and double the amount could be used to advantage—no further extension in this direction is possible.

The display of wind signals has continued as heretofore, and the new system of signals has given satisfaction.

The display of signals was discontinued at stations on Lake Superior from December 1, 1886, to May 1, 1887, and at all other lake stations from December 16, 1886, to May 1, 1887.

Up to November 20, 1886, observers at regular stations displaying wind signals and displaymen at special display stations acknowledged receipt of orders to hoist or lower signals by telegraph; but on the latter date, in the interests of economy, all acknowledgments were ordered to be made by mail. The change has proven a satisfactory as well as an economical measure.

The following display stations were opened during the year: Hull, Chatham, Gay Head Light, and Nobska Light, Massachusetts; Sandy Hook, New Jersey; Sodus Point N. Y.; Morehead City, N. C.; Seattle, Wash.; and White Head, Maine.

For sufficient reasons the following special stations were closed: Green Bay, Wis.; Corpus Christi, Tex.; Bass River Light, Wood's Holl, and Fall River, Mass.; Rockland and Bath, Me.; Bristol, R. I.; Montague and Pentwater, Mich.; Sand Key Light and Appalachicola, Fla.; and Barnegat City, N. J.

There are now in operation 65 special display stations, and wind signals are displayed at 50 regular stations on the sea coasts and Great Lakes, making a total of 115.

The average cost of these special display stations I find to be about $50 for the outfit, exclusive of the flag-staff. In addition to this, the pay of the observers ranges from 30 cents to $1.05 per day. I recently computed the cost of each signal displayed, and I find that for the fiscal year just ended the display of each signal on the Great Lakes has averaged about $3.29 in cost to this service. On the New England coast and as far south as Morehead, N. C., each display has cost an average of $2.13; south of that point each display at each station has cost $12.02. Doubtless the benefits derived from these displays are very much in excess of what they cost, yet it would appear that the cost of the displays is excessive, particularly on the South Atlantic and Gulf coasts, and it is my intention to shortly present for your consideration a scheme which will materially reduce the cost of each display. This scheme will apply to the sections just mentioned, as also to the Great Lakes. The costs of the displays on the New England and

Middle Atlantic coasts is now about a fair payment for the services rendered. It is my expectation that if this proposition is successfully carried out, with the money appropriated each year we will be able to maintain a somewhat greater number of display stations, and thus extend the benefits of this most important branch of our service to a larger number of persons interested in the maritime pursuits.

The display of weather signals by railroads and private individuals throughout the country has continued at about 300 points, to which, until March 4, 1887, the indications were telegraphed at Government expense. On the latter date, owing to failure of the deficiency bill to become a law, it became necessary to discontinue telegraphing all reports of this nature. This action continued in force until June 10, 1887, when, it having been found that a small saving in our telegraphic appropriation had resulted from the adoption of the new cipher code for pressure and temperature, indications were resumed to regular stations and to about one-third of the special stations at the cost of this service.

The amount of interest displayed in this branch of Signal Service work is remarkable, and applications for the indications are so numerous, that great discretion has to be exercised in granting such requests in order to have the benefits accrue to the largest possible number. The correspondence in relation to this portion of work is necessarily very large, and consumes a greater portion of the time of one clerk in its preparation.

Persons displaying weather signals are required in each case to procure the necessary flags, attend to their prompt and proper display upon receipt of telegrams, and make monthly reports to this office on forms furnished for that purpose.

The system of cold-wave warnings continues to grow in popular favor and has continued in operation, and there is no branch of meteorological work (aside from the regular daily weather predictions and publications) that gives such general satisfaction to the public.

The general public thoroughly understand the meaning of the term "cold wave" as used by the Signal Service, and the large percentage of verifications of cold-wave predictions has inspired confidence in the warnings.

The following regular Signal Service stations were established as cold-wave signal stations during the year:

Valentine, Nebr.; Columbia, S. C.; Lansing, Mich.; Oxford, Miss.; Raleigh, N. C.; Topeka, Kans.; New Brunswick, N. J.; Wood's Holl, Mass.; Las Animas, Colo.; Titusville, Fla.; Lexington, Ky.; and Springfield, Mo.

There are now 77 regular Signal Service stations at which the cold-wave signal is displayed.

I desire to call attention to the fact that in quite a number of cities in which we have stations Government buildings are in the course of erection, or have been erected, in which, in most cases, we can obtain office rooms and proper exposure for instruments. In the cases of Columbus, Ohio, Dubuque, Iowa, Pensacola, Fla., and Shreveport, La., is illustrated the difficulty to be met with in taking advantage of this fact. For instance, take Dubuque, Iowa: The rent of the office at that station is $120 per year, and it would cost in the neighborhood of $250 to move into the Government building; in other words, the change would not be in the interest of economy when considered in reference to one fiscal year; but when viewed as to the future, it would result in a saving of $120 per year, as we have to pay no rent when we occupy a Government building. In the other cases the cost of moving is greater than the rent for a year, and therefore the removals can not take place on account of the lack of money sufficient for the purpose. If in the item for "rents," etc., in the general appropriation for the Signal Service, a small amount (say $2,000) could be included for this purpose, the result would be a large saving to the Government in the long run, and I would strongly urge that such an estimate be made.

In reference to the appropriation expended under my direction as stations officer, I wish to refer particularly to item "For rents, etc., of offices maintained as stations of observation outside of Washington, D. C." The amount of this item is $35,000, and from it we pay, first, the rent of all offices, which amounts to about $20,000; the hire of all janitors, messengers—in fact, all civilian employés; also the rent of telephones, the cost of all furniture and stationery, and the many other expenses required for the proper maintenance of these stations. The number of stations maintained during the past fiscal year was about 150, and their maintenance during that period has only been possible by the exercise of the most rigid economy with the sum of money allowed. When I took charge of this division, in 1886, the major portion of these stations were supplied with furniture that had been in use many years and greatly out of repair; so that the reports of most inspectors would indicate that our offices, as a rule, are a standing disgrace to the Government. In addition to this, very few of our stations were properly supplied with instruments or instrument shelters, and in a great majority of cases the instruments in use had been in use for a long period of time and were generally in a di-

lapidated condition. Since that time it has been my endeavor to right this discreditable state of affairs, and place each and every one of our stations in at least a presentable appearance and give each one instruments from which accurate observations could be obtained. I have already mentioned in this report some of the results of my endeavors, and I expect during the coming fiscal year to be able to place quite a number of stations in good condition so far as instruments and furniture are concerned.

The number of men at my disposal during the past year has been, and is at present, somewhat in excess of the number necessary for the management of the different stations in previous years, and this fact has rendered it possible for me to dispense with civilian employés, and expend the money thus saved in the purchase of furniture and in placing the stations in a generally presentable condition.

During the coming fiscal year it is my expectation to employ few civilian employés at the different stations, and thus there will be a small amount available to continue the work of renovating the offices.

If for one fiscal year this appropriation for "rents," etc., was increased to $50,000, I am quite confident I could place every station in the service in the best possible condition; in fact, make each office a model one, and at the same time open quite a number of new stations, which the work of our service demands; and thereafter, if an annual appropriation of $45,000 was given for this purpose this increased number of stations could be maintained, and there is but little doubt that the result would be a very largely increased benefit to commercial and agricultural interests of the country, as well as the maritime interests, in the way of increased accuracy of predictions and covering with more careful observations the country in which the staple products are raised. I earnestly recommend that the Chief Signal Officer urge upon Congress the advisability of making this increased appropriation. In this connection I desire to call the attention of the Chief Signal Officer to the fact that previous to June 30, 1883, the amount of this appropriation was $45,000, but since that time the appropriation has been but $35,000; and yet with a smaller appropriation we have managed to maintain this service in operation and have given to the people in this country a more efficient service, while at the same time, for lack of money, the stations themselves have become more or less dilapidated; hence the necessity for the increase above recommended.

In reference to the personnel of the Corps, the major portion of whom are under my command, I have to report that I have experienced considerable difficulty in maintaining a high state of efficiency, owing to the fact that all new men in the service who have during the past fiscal year been sent to stations have gone without full instructions as to the various duties they are required to perform. This fact has, in many instances, seriously crippled the work of many stations, and has caused much complaint from our oldest and best observers. However, there seems to be no way to obviate the difficulty, as Congress has forbidden any thing like a school for the purpose of instructing these men.

The discipline of that portion of the corps on duty outside of Washington, D. C., has gradually improved during the past year, as shown by the prompt rendition of the reports from most stations, and the generally high standard of accuracy attained by most observers in said reports.

The arrangement of rooms assigned to the stations division in this office is such that a messenger is in almost constant demand carrying books and papers between the different subdivisions and other parts of the office. This difficulty might be obviated by assigning to this division a number of rooms in one building, and I hope that when opportunity offers this may be done.

In conclusion, I commend to the consideration of the Chief Signal Officer the men of this division, who have rendered most faithful and efficient service during the entire fiscal year. At intervals during the year the work has been largely in excess of the routine; but these men have met every demand made upon them, and have, almost without exception, acquitted themselves with credit.

I am, very respectfully, your obedient servant,

F. R. DAY,
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER,
Washington, D. C.

APPENDIX No. 8.

REPORT OF CORRESPONDENCE DIVISION, WITH INCLOSURES.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, July 21, 1887.

SIR: I have the honor to submit the annual report of the correspondence division for the year ending June 30, 1887:

Second Lieut. James Mitchell relieved Second Lieut. Benjamin M. Purssell on August 4, 1886, of charge of the division, the name of which was changed on March 1, 1887, from correspondence and records division, in view of the establishment of a separate division entitled records division, having charge of meteorological records, etc. No change has been made in the number of clerks on duty in the division, but Alexander Ashley was superseded by James B. McLaughlin as chief clerk of the bureau on June 1, 1887.

This division, the executive or adjutant's office of the service, is charged with the preparation and issue of all printed circulars, instructions, and orders, general and special, relating to the duties or changing the stations of officers and men; securing the necessary transportation, and giving special instructions in connection; the educational examination of candidates desiring to enlist in the service, and the enlistment, re-enlistment, and discharge of the men, and correspondence connected therewith; keeping the records of correspondence of all the divisions of the office, with the exception of the property and disbursing division and other minor exceptions; searching the records for data in cases of applicants for pension and reporting thereon; and generally all correspondence on matters not devolved upon any of the other divisions. These duties have been discharged during the year with more than the usual dispatch, and a considerable amount of back work performed in indexing the war records of the Signal Corps, thus enabling early action to be had in the cases of applicants for pension. The action of the present Chief Signal Officer in discontinuing circumlocutory methods and adopting, wherever practicable, such modes of transacting business as combine the greatest speed with the least clerical labor, with due regard to the proper record of business, has already resulted, and will, it is believed, result to a much greater extent in the future, in releasing men, both at this office and at stations, from the performance of unprofitable work, and making them available for other duties more pressing and of greater public interest.

As the several divisions of the office charged with the special duties will report fully on subjects proper to be brought to the attention of the Chief Signal Officer, it is only considered necessary to mention the following occurrences of somewhat general interest: The loss of the school of instruction for the service and the post of Fort Myer, Va., and of 30 of the enlisted force of the service by action of Congress; the deficiency in appropriations for telegraphing, and the consequent disappointment or dissatisfaction of the public, who desired indications by telegraph for the display of weather signals; the exhaustion early in the fiscal year of the appropriation for transportation of men, and the embarrassment resulting afterwards from inability to move men for any cause; and it is thought proper to refer to the disadvantages under which this bureau labors for want of proper office accommodations in this city, the office now being scattered in many buildings, causing delay in transaction of business and increased expense for pay of messengers, etc.

Inclosed herewith are the lists, in duplicate, usually furnished by the correspondence division, showing—

Number, etc., of communications received at and sent from this office during the fiscal year;

Stations inspected during the year;

Meteorological committees of boards of trade, chambers of commerce, etc., in communication with this office during the year;

Names of places at which the establishment of stations were requested during the year;

Meteorological data furnished persons for various uses during the year.

Very respectfully, your obedient servant,

J. MITCHELL,
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER.

Number of communications sent from and received in all the divisions of the Signal Office, Washington City, from July 1, 1886, to June 30, 1887.

SENT.

To heads of Departments and Bureaus	1,100
To observers at stations in reference to their duties	19,431
To applicants for establishment of stations	286
To telegraph companies in reference to transmission of weather reports and the erection of telegraph lines, etc	351
To boards of trade, chambers of commerce, meteorological committees, etc	448
To foreign correspondents relating to simultaneous weather reports, etc	707
To shipmasters, etc., relative to reports	3,002
To voluntary observers throughout the United States	7,079
To postmasters relative to farmers' bulletins, etc	1,635
To railroad companies, relative to establishing stations, furnishing indications, etc	295
To signal officers relative to their duties	286
Orders, circulars, instructions, etc	56,641
Relative to enlistments, discharges, etc	1,301
Relative to publications	684
Relative to money, property, etc., by the property and disbursing officer	38,250
Relative to furnishing meteorological instruments, charts, books, forms, etc	910
Relative to building, repair, sale, etc., of telegraph lines	148
Relative to quarterly returns of officers, etc	2,185
Relative to furnishing indications and predictions	2,064
Relative to data requested	560
Miscellaneous	178
Total	137,541

RECEIVED.

From heads of Departments and Bureaus	8,238
Applications for establishment of new stations	48
Applications for tornado information	1,066
From telegraph companies in reference to the transmission of weather reports and the construction of telegraph lines, etc	311
From boards of trade, chambers of commerce, etc	217
Surgeons' certificates	88
Examination papers (sets) of candidates for enlistment	74
From observers in reference to their duties	11,027
Returns, discharges, final statements, descriptive lists, etc	780
From United States naval stations and vessels	6,495
From foreign correspondents	4,706
From voluntary observers throughout the United States	9,343
From United States military posts (surgeons' meteorological reports)	717
Relating to duties and discipline at Signal Service school of instruction at Fort Myer, Va	36
Relating to instruction in military signaling at posts	1,614
Applications for enlistment	478
Instruction reports	1,755
Reports from railroad stations in reference to weather reports	14,069
Meteorological forms, etc., from stations	178,402
Reports from postmasters in reference to weather bulletins	1,980
Acknowledgments of orders, circulars, etc	12,285
From manufacturers and others in reference to instruments, equipments, etc	3,581
From officers, observers, etc., concerning property and money accounts	29,305
Miscellaneous	11,237
Total received	297,852
Total sent	137,541
Total sent and received	435,393

TELEGRAMS.

Cipher words and reports sent and received	1,550,000
Telegrams other than weather reports sent and received	75,150

Stations inspected during fiscal year ending June 30, 1887.

Stations.	By whom inspected.	Date.
Albany, N. Y	Lieut. F. M. M. Beall, Signal Corps	August 19, 20, 1886.
Alpena, Mich	do	September 7, 8, 1886.
Assinaboine, Fort, Mont	Lieut. B. M. Purssell, Signal Corps	September 13, 14, 1886.
Atlantic City, N. J	Lieut. T. M. Woodruff, Acting Signal Officer.	October 22, 23, 1886.
Ash Fork, Ariz	Lieut. R. B. Watkins, Signal Corps	March 18, 1887.
Apache, Fort, Ariz	do	March 21, 22, 1887.
Abilene, Tex	do	April 11, 12, 1887.
Boston, Mass	Lieut. F. M. M. Beall, Signal Corps	August 7–10, 1886.
Buffalo, N. Y	do	August 24, 25, 1886.
Bismarck, Dak	Lieut. B. M. Purssell, Signal Corps	August 21–24, 1886.
Buford, Fort, Dak	do	August 26, 27, 1886.
Benton, Fort, Mont	do	September 12, 13, 1886.
Bridger, Fort, Wyo	Lieut. F. R. Day, Signal Corps	September 11, 12, 1886.
Boisé City, Idaho	do	September 18, 1886.
Block Island, R. I	Lieut. T. M. Woodruff, Acting Signal Officer.	October 2, 3, 1886.
Bowie, Fort, Ariz	Lieut. W. A. Glassford, Signal Corps	February 11, 12, 1887.
Cleveland, Ohio	Lieut. F. M. M. Beall, Signal Corps	August 28–30, 1886.
Chicago, Ill	do	October 3–6, 1886.
Custer, Fort, Mont	Lieut. B. M. Purssell, Signal Corps	September 5, 6, 1886.
Cœur d'Alene, Fort, Idaho	do	September 18, 19, 1886.
Cairo, Ill	Lieut. F. R. Day, Signal Corps	August 15, 16, 1886.
Concordia, Kans	do	August 18, 19, 1886.
Cheyenne, Wyo	do	September 3, 1886.
Carter Station, Wyo	do	September 11, 1886.
Cape Henry, Va	do	October 31, 1886.
Cottage City, Mass	Lieut. T. M. Woodruff, Acting Signal Officer.	September 15, 1886.
Chincoteague, Va	do	October 27, 28, 1886.
Cape Henlopen, Del	do	October 29, 1886.
Columbus, Ohio	Lieut. Frank W. Ellis, Signal Corps	May 18–20, 1887.
Cincinnati, Ohio	do	May 23–27, 1887.
Detroit, Mich	Lieut. F. M. M. Beall, Signal Corps	September 3, 4, 1886.
Duluth, Minn	do	September 23, 1886.
Dubuque, Iowa	do	September 25, 26, 1886.
Des Moines, Iowa	do	September 28, 29, 1886.
Davenport, Iowa	do	October 2, 1886.
Deadwood, Dak	Lieut. F. R. Day, Signal Corps	August 27, 28, 1886.
Denver, Colo	do	September 23–25, 1886.
Dodge City, Kans	do	September 29, 1886.
Davis, Fort, Tex	Lieut. R. B. Watkins, Signal Corps	April 8, 9, 1887.
Eastport, Me	Lieut. F. M. M. Beall, Signal Corps	August 12, 13, 1886.
Erie, Pa	do	August 26, 27, 1886.
Escanaba, Mich	do	September 12, 13, 1886.
Elliott, Fort, Tex	Lieut. F. R. Day, Signal Corps	October 6, 1886.
Edgartown, Mass	Lieut. T. M. Woodruff, Acting Signal Officer.	September 13, 14, 1886.
El Paso, Tex	Lieut. R. B. Watkins, Signal Corps	April 4, 5, 1887.
Frisco, Utah	Lieut. F. R. Day, Signal Corps	September 15, 1886.
Fort Macon, N. C	do	November 6, 1886.
Grand Haven, Mich	Lieut. F. M. M. Beall, Signal Corps	September 16, 17, 1886.
Grant, Fort, Ariz	Lieut. W. A. Glassford, Signal Corps	February 15–17, 1887.
Huron, Dak	Lieut. B. M. Purssell, Signal Corps	August 12, 13, 1886.
Helena, Mont	do	September 8–10, 1886.
Hatteras, N. C	Lieut. F. R. Day, Signal Corps	November 4, 1886.
Henrietta, Tex	Lieut. R. B. Watkins, Signal Corps	April 16, 1887.
Keokuk, Iowa	Lieut. F. M. M. Beall, Signal Corps	September 30, 1886.
Knoxville, Tenn	Lieut. F. R. Day, Signal Corps	October 25, 1886.
Kitty Hawk, N. C	do	November 1, 2, 1886.
La Crosse, Wis	Lieut. F. M. M. Beall, Signal Corps	September 24, 25, 1886.
Leavenworth, Kans	Lieut. F. R. Day, Signal Corps	August 17, 18, 1886.
Lamar, Mo	do	October 13, 14, 1886.
Little Rock, Ark	do	October 16, 17, 1886.
Little Rock, Ark	Lieut. Frank W. Ellis, Signal Corps	June 12–14, 1887.
Lynchburg, Va	Lieut. F. R. Day, Signal Corps	October 26, 27, 1886.
Los Angeles, Cal	Lieut. W. A. Glassford, Signal Corps	January 24–27, 1887.
Lava, N. Mex	Lieut. R. B. Watkins, Signal Corps	April 2, 1887.
Louisville, Ky	Lieut. Frank W. Ellis, Signal Corps	June 1–3, 1887.
Mount Washington, N. H	Lieut. F. M. M. Beall, Signal Corps	August 16, 17, 1886.
Mackinaw City, Mich	do	September 9, 10, 1886.
Marquette, Mich	do	September 11, 12, 1886.
Milwaukee, Wis	do	September 14, 15, 1886.
Maginnis, Fort, Mont	Lieut. B. M. Purssell, Signal Corps	September 2, 3, 1886.
Moorhead, Minn	do	October 3, 4, 1886.
Montrose, Colo	Lieut. F. R. Day, Signal Corps	September 21, 1886.
Memphis, Tenn	do	October 18, 19, 1886.
Memphis, Tenn	Lieut. Frank W. Ellis, Signal Corps	June 8–10, 1887.
Maricopa, Ariz	Lieut. W. A. Glassford, Signal Corps	February 7, 8, 1887.
McDowell, Fort, Ariz	do	March 2, 3, 1887.
Marfa, Tex	Lieut. R. B. Watkins, Signal Corps	April 9, 1887.

Stations inspected during fiscal year ending June 30, 1887—Continued.

Stations.	By whom inspected.	Date.
North Platte, Nebr	Lieut. F. R. Day, Signal Corps	August 31, 1886.
Nashville, Tenn	do	October 20, 21, 1886.
Nashville, Tenn.	Lieut. Frank W. Ellis, Signal Corps	June 4-7, 1887.
New River Inlet, N. C	do	November 8, 1886.
Nantucket, Mass	Lieut. T. M. Woodruff, Acting Signal Officer.	September 7-10, 1886.
Narragansett Pier	do	October 1, 1886.
New London, Conn	do	October 5-7, 1886.
New Haven, Conn	do	October 8, 9, 1886.
New York City	do	October, 1886.
Oswego, N. Y	Lieut. F. M. M. Beall, Signal Corps	August 21, 22, 1886.
Omaha, Nebr	Lieut. F. R. Day, Signal Corps	August 21, 22, 1886.
Ocean City, Md	Lieut. T. M. Woodruff, Acting Signal Officer.	October 28, 1886.
Portland, Me	Lieut. F. M. M. Beall, Signal Corps	August 11, 1886.
Port Huron, Mich	do	September 5, 6, 1886.
Poplar River, Mont	Lieut. B. M. Purssell, Signal Corps	August 28, 29, 1886.
Pike's Peak, Colo	Lieut. F. R. Day, Signal Corps	September 7-9, 1886.
Philadelphia, Pa	Lieut. T. M. Woodruff, Acting Signal Officer.	October 24, 25, 1886.
Phœnix, Ariz	Lieut. W. A. Glassford, Signal Corps	February 28, 1887.
Prescott, Ariz	do	March 12-15, 1887.
Rochester, N. Y	Lieut. F. M. M. Beall, Signal Corps	August 22, 23, 1886.
Robinson, Fort, Nebr	Lieut F. R. Day, Signal Corps	August 26, 1886.
Reno, Fort, Ind. T	do	October 10, 11, 1886.
Sandusky, Ohio	Lieut. F. M. M. Beall, Signal Corps	August 30, 31, 1886.
Saint Paul, Minn	do	September 20-22, 1886.
Sully, Fort, Dak	Lieut. B. M. Purssell, Signal Corps	August 14-16, 1886.
Shaw, Fort, Mont	do	September 11, 1886.
Spokane, Fort, Wash	do	September 20, 21, 1886.
Spokane Falls, Wash	do	September 22, 23, 1886.
Saint Vincent, Minn	do	October 1, 2, 1886.
Saint Louis, Mo	Lieut. F. R. Day, Signal Corps	August 12-14, 1886.
Salt Lake City, Utah	do	September 13, 1886.
Supply, Fort, Ind. T	do	October 23, 1886.
Smith, Fort, Ark	do	October 15, 1886.
Smith, Fort, Ark	Lieut. Frank W. Ellis, Signal Corps	June 15-18, 1887.
Smithville, N. C	Lieut. F. R. Day, Signal Corps	November 11, 1886.
Sandy Hook, N, J	Lieut. T. M. Woodruff, Acting Signal Officer.	October 13, 14, 1886.
San Francisco, Cal	Lieut. W. A. Glassford, Signal Corps	January 17, 21, 1886.
San Diego, Cal	do	January 29, February 1, 1887.
San Carlos, Ariz	do	February 21, 22, 1887.
Santa Fé, N. Mex	Lieut. R. B. Watkins, Signal Corps	March 25, 26, 1887.
Stanton, Fort, N. Mex	do	March 30, 31, 1887.
Sill, Fort, Ind T	do	April 14, 15, 1887.
Toledo, Ohio	Lieut. F. M. M Beall, Signal Corps	September 1, 2, 1886.
Totten, Fort, Dak	Lieut. B. M. Purssell, Signal Corps	September 28, 29, 1886.
Thomas, Fort, Ariz	Lieut. W. A. Glassford, Signal Corps	February 19, 20, 1887.
Valentine, Nebr	Lieut. F. R. Day, Signal Corps	August 25, 1886.
Verde, Fort, Ariz	Lieut. W. A. Glassford, Signal Corps	March 7-9, 1887.
Walla Walla, Wash	Lieut. B. M. Purssell, Signal Corps	September 24, 1886.
Las Animas, Colo	Lieut. F. R. Day, Signal Corps	September 28, 1886.
Wash Woods, N. C	do	October 31, 1886.
Wilmington, N. C	do	November 9, 10, 1886.
Wilcox, Ariz	Lieut. W. A. Glassford, Signal Corps	February 14, 1887.
Yankton, Dak	Lieut. B. M. Purssell, Signal Corps	August 10, 11, 1886.
Yates, Fort, Dak	do	August 19, 20, 1886.
Yuma, Ariz	Lieut. W. A. Glassford, Signal Corps	February 3-5, 1887.

List of Boards of Trade, Chambers of Commerce, and other organizations which had, during the year ending June 30, 1887, meteorological committees conferring with the Chief Signal Officer of the Army.

Place.	Name of organization.	Committees.
Albany, N. Y.	Board of Trade	Charles B. Tillinghast, Edward A. Durant, J. Townsend Lansing.
Alpena, Mich	Board of Underwriters	Henry S. Seage, John N. Kelley, J. D. Holmes, B. F. Luce, Chas. H. Luce.
Augusta, Ga	Augusta Cotton Exchange	J. B. Preston, N. Kahrs, H. Ernst.
Block Island, R. I.		B. B. Mitchell, Ray S. Littlefield, Charles E. Perry.
Buffalo, N. Y.	Merchants' Exchange	Nathan C. Simons, Frank W. Fiske, Chas. H. Arthur.
Cedar Keys, Fla.	Board of Trade	J. S. Bodiford, J. E. Richards, R. M. Dozier.
Charleston, S. C.	Chamber of Commerce	L. D. DeSaussure, J. L. Sheppard, S. V. Stewart.
Do.	Merchants' Exchange	Geo. W. Bell, T. Follett Ware, John Dougherty.
Charlotte, N. C.	Chamber of Commerce	T. F. Drayton, S. A. Cohen, W. W. Flemming.
Cleveland, Ohio	Board of Trade	R. K. Winslow, chairman, R. T. Lyon, Capt. W. B. Guyles.
Concordia, Kans.		B. H. McEkron, Theo. Laing, Prof. T. A. Sawhill.
Denver, Colo.	Chamber of Commerce	Chas. F. Wilson, Herman Silver, C. H. Reynolds, J. D. Best, H. H. Metcalf.
Erie, Penn.	Board of Trade	J. J. Wadsworth, H. S. Jones, Geo. Platt.
Grand Haven, Mich.		Hon. Dwight Cutler, T. W. Kirby, G. W. A. Smith.
Huron, Dak.	Board of Trade	John Cain, Augustine Dovis, Hon. Geo. W. Sterling.
Indianapolis, Ind.	do	George W. Sloan, A. J. Halford, Jas. R. Carnehan.
Jacksonville, Fla.	Jacksonville Board of Trade.	Dr. A. S. Baldwin, Reed, Clark, Bower, Fuerlie.
Little Rock, Ark.	Cotton and Produce Exchange.	Logan H. Roots, chairman, John G. Fletcher. John D. Adams, R. H. Farquhar.
Los Angeles, Cal.	Los Angeles Board of Trade.	Eugene Germain, Vinton L. Mitchell, W. A. Clinton.
Louisville, Ky.	Polytechnic Society	E. A. Grant, M. D., James L. Howe, Laf. Joseph.
Memphis, Tenn.	Merchants' Exchange	R. C. Graves, H. E. Coffin, R. A. Shields.
Mobile, Ala.	Mobile Cotton Exchange	Adolph Proskauer, chairman, D. E. Huger, J. W. Whiting.
New Orleans, La.	Cotton Exchange	Jas. A. Renshaw, chairman, J. L. McLean, R. S. Day, J. P. Dobbins.
Norfolk, Va.	Norfolk and Portsmouth Cotton Exchange.	John N. Vaughan, Adam Tredwell.
Northfield, Vt.	Board of Trustees, Norwich University.	Dr. Geo. Nichols, Hiram Atkins, Dr. Wm. B. Mayo.
Oswego, N. Y.	Board of Trade	J. L. McWhorter, A. S. Failing, W. R. Hosmer.
Philadelphia, Pa.	Philadelphia Maritime Exchange.	Charles Gibbons, jr., Wm. A. Platt, J. E. Morse.
Pittsburg, Pa.	Coal Exchange	Richard Barrows, M. E. Lynn, John W. Risher.
Portland, Oregon	Chamber of Commerce and Board of Trade.	Rev. Dr. Geo. H. Atkinson, E. H. Page, Geo. H. Himes.
Rochester, N. Y.	Merchants' Exchange	John Siddons, H. S. Hebard, Geo. Schofield.
San Diego, Cal.	Society of Natural History	Dr. G. W. Barnes, Dr. H. W. Gould, C. J. Fox.
Savannah, Ga.	Savannah Cotton Exchange.	C. M. Holst, A. L. Hartridge, J. J. Wilder.
Salt Lake City, Utah	Chamber of Commerce	C. F. Annett, Geo. Arbogast, W. A. Neldon, J. S. Sharp.
Saint Paul, Minn.	Saint Paul Chamber of Commerce.	R. O. Sweeney, Rev. David Breed, M. N. Kellog.
Toledo, Ohio	To edo Produce Exchange	W. T. Carrington, Frank I. Young, W. Cummings.
Vicksburg, Miss.	City	Thomas Mount, Dr. G. W. Howard, J. D. Tinney.
Yankton, Dak.	do	J. C. McVay, chairman, A. W. Barber, H. G. Clark.

List of places for which stations have been requested during fiscal year, but not established to June 30, 1887.

Alabama:
Birmingham, January 17, 1887.
California:
Fresno, February 2, 1887.
March 11, 1887.
June 7, 1887.
Point Reyes, October 18, 1886.
Saint Helena, July 25, 1886.
August 4, 1886.
Dakota:
Hillsboro', May 9, 1887.
Florida:
Fort George, October 25, 1886.
Illinois:
Bloomington, October 4, 1886.
Indiana:
Remington, January 22, 1887.
Kansas:
Syracuse, December 9, 1886.
Kentucky:
Mount Sterling, September 20, 1886.
Lexington, February 14, 1887.
Maryland:
Cove Point, May 21, 1887.
Island City, February 25, 1887.
Michigan:
Manistee, August 21, 1886.
Minnesota:
Benson, December 23, 1886.
Mississippi:
Biloxi, January 9, 1887.
Jackson, December 10, 1886.
Missouri:
Maryville, May 30, 1887.
Springfield, February 23, 1887.
New Mexico:
Las Vegas, April 18, 1887.
New York:
Potsdam, August 17, 1886.
Mount McGregor, July 14, 1886.
August 24, 1886.
North Carolina:
Beaufort, January 18, 1887.
Winston, August 25, 1886.
Ohio:
New Philadelphia, July 16, 1886.
Pennsylvania:
Lewisburgh, June 8, 1887.
South Carolina:
McCormick, November 25, 1886.
Texas:
Mount Blanc, January 4, 1887.
Victoria, August 21, 1886.
Virginia:
Farmville, January 26, 1887.
Richmond, February 23, 1887.
Washington Territory:
East Sound, February 18, 1887.
Wisconsin:
Black River Falls, February 12, 1887.
Mineral Point, December 21, 1886.

Meteorological data was furnished 254 different persons during the year ending June 30, 1887, at their request, for the following purposes, viz:

To be used in State or United States courts as evidence.

To be used in compiling works or publications on meteorology, hygiene, agriculture, manufactures, commerce, etc.

To assist in manufactures, the prosecution of the arts, and advancement of the sciences.

To settle questions as to the relations of meteorology and agriculture.

In deciding the cause and locating the responsibility in railroad and marine disasters.

In fixing the responsibility of damage to freight in transit by common carriers.

In acquainting immigrants with the climatology of districts open to settlement.

In informing invalids of the desirability of the meteorology of sections affecting their diseases.

Miscellaneous purposes.

APPENDIX No. 9.

ANNUAL REPORT OF THE TELEGRAPH DIVISION FOR THE YEAR ENDING JUNE 30, 1887.

One million five hundred and fifty thousand cipher words (weather reports), and 75,000 telegrams, other than cipher reports, were received at and sent from this office during the year. One hundred and sixty-two bills of telegraph companies for services rendered were audited; 12 monthly and 6 supplementary cost estimates prepared; and abstracts furnished covering a period of twelve months, from 1884 to 1885, and showing in detail the number of cipher words sent to and received from each station. Telegraphic forms and reports from stations and pertaining to telegraphic services performed by commercial companies, also the special forms and reports from operators on the military and sea-coast telegraph lines, were examined, acted upon, and filed; and the necessary correspondence was had with telegraph companies and with the men serving as operators and repairmen on the United States telegraph lines.

SEA-COAST TELEGRAPH LINES.

A one-conductor cable, 15 miles long, was laid between Cape Henry and Cape Charles, Virginia, on November 27, 1886, connecting at Cape Henry with the Norfolk-Hatteras line, and at Cape Charles with the wires of the New York, Philadelphia and Norfolk Railroad Company. A second cable, 11.2 miles long, was laid November 16, 1886, between Block Island, Rhode Island, and the main-land, to take the place of the old cable, which had been unserviceable since October 14, 1885. The land lines on Block Island and on the main-land were entirely rebuilt with iron poles during April, 1887, and this section is now in excellent condition.

On Martha's Vineyard, Massachusetts, a telephone line, 15 miles in length, was built from Cedar Tree Neck to Gay Head light-house, to permit the display of cautionary signals at that point, as well as for use in case of wrecks. Lieut. J. H. Weber, Signal Corps, assumed charge of the lines on Martha's Vineyard and Nantucket on August 18, 1886.

The entire line from Norfolk, Va., to Hatteras, N. C., was thoroughly repaired and reconstructed in places under the supervision of Sergt. William Bolton, including the telephone wires connecting the numerous life-saving stations on that coast. This section is now in first-class condition, and every possible effort will be made to maintain it so.

Extensive general repairs were also made to the line between Wilmington and Southport, N. C., under the supervision of Sergt. E. E. Perry.

The section from Little Egg Harbor to Cape May, New Jersey, and that from Hatteras to Wilmington, N. C., being in bad repair and of no further value to public interests, were abandoned and sold at public auction, with the approval of the honorable Secretary of War.

The operation by this service of the line from Cape Henlopen, Delaware, to Chincoteague, Va., was discontinued June 30, 1887, and the line transferred absolutely to the Life-Saving Service, together with those sections on the New Jersey coast which had been transferred provisionally during former years.

A new line from Titusville to Jupiter Inlet, Florida, about 135 miles, is now under construction. Up to June 30 nine-tenths of the poles had been cut, peeled, and trimmed, 20 miles line staked out, and the greater part of the line material distributed. Lieut. B. M. Purssell, Signal Corps, is in charge of the work.

The following sections of sea-coast lines remain in operation July 1, 1887, viz:

	Miles.
Norfolk to Hatteras, including Cape Charles Branch	194
Wilmington to Southport	30
Block Island to Narragansett Pier	31
Wood's Holl to Nantucket, including Gay Head Branch	76
Total sea-coast lines	331

MILITARY TELEGRAPH LINES.

There were in operation at the beginning of the year 2,475 miles of military telegraph lines, under the control of the Chief Signal Officer. No new lines were built during the year, excepting a short extension of the Fort Robinson section to the railroad office at Crawford, Nebr., distant 3 miles. A line, built out of old material and by the labor of troops, is now under construction between Fort Du Chesne and Price Station, Utah, a distance of about 87 miles. Four hundred and fifty-six miles of line were abandoned, as hereinafter detailed.

The lines in operation at the beginning and close of the fiscal year were distributed among the several departments as follows:

Department of—	Beginning of year.	End of year.
	Miles.	*Miles.*
Dakota	740	517
The Missouri	582	432
California and the Columbia	444	414
Arizona	510	457
Texas	124	124
The Platte	75	78
Total	2,475	2,022

Following is a brief description of the several detached sections in each department, viz:

Department of Dakota.—Fort Maginnis section, 367 miles, from Glendive, Mont., via Fort Buford, Camp Poplar River, and Galpin, to Fort Maginnis, Mont.: General repairs were made by troops during November and December, 1886, and the line has worked very satisfactorily during the entire year. The extension of the Saint Paul, Minneapolis and Manitoba Railroad to Fort Buford and Poplar River will shortly admit of the abandonment of the line from near Galpin to Glendive, a little over one-half of the entire line.

Fort Custer section, 30 miles, from Fort Custer, Mont., to Custer Station, Mont.: General repairs made by troops during November, 1886. The poles are becoming unserviceable from decay and frequent resetting, and as none but cottonwood poles can be cut in the vicinity, it is intended to gradually reconstruct this line on iron poles as obtained from abandoned lines.

Bismarck section, 55 miles, from Bismarck, via Fort Abraham Lincoln, to Fort Yates, Dak.: This section worked very efficiently until the portion between Fort Abraham Lincoln and Bismarck was completely demolished by the flood of March 18, 1887. Permission was obtained to use the Western Union Company's poles between Bismarck and Mandan, and the Erie Telephone Company's poles thence to Fort Lincoln, on which to string the military wire, instead of entirely rebuilding the demolished line. Pending the arrival of the necessary wire, telegrams to and from Forts Yates and Lincoln were sent via Mandan and without causing any serious delay or inconvenience.

Fort Sisseton section, 23 miles, from Fort Sisseton to Webster, Dak.: This line is operated with telephones and is under the immediate control of the post authorities.

Fort Assinaboine section, 208 miles, from Helena, via Fort Shaw and Fort Benton, to Fort Assinaboine, Mont.: This section, being in poor condition and very expensive to maintain, was sold at public auction on September 30, 1886, on condition that the purchaser maintain it in efficient working order so long as the United States may have occasion to use it, and that official messages be transmitted at Government rates. A bond of $2,000 was furnished binding the purchaser to these conditions.

Fort Meade section, between Deadwood and Fort Meade, Dak., 15 miles, was sold at public auction on March 10, 1887, as connection with the post had been established by the Western Union Telegraph Company.

Department of the Missouri.—The Indian Territory section, 438 miles, extended from Dodge City, Kans., to Henrietta, Tex., via Fort Supply, Fort Elliot, Cantonment, Fort Reno, and Fort Sill: Most of the wooden poles on this section have been gradually replaced by iron ones, greatly increasing the efficiency of this line. General repairs by troops were made during March and April, 1887. As great difficulty had been experienced in former years to maintain the span across the Canadian River, south of Fort Reno, during high water, a substantial derrick or tower was erected on each bank of sufficient height to securely support a steel wire above reach of the periodical floods. The extension of the Southern Kansas Railroad Company's telegraph line to a point 14 miles south

of Fort Supply offered a shorter and safer outlet for the entire section than was afforded by the Dodge City and Henrietta connections. The lines from Fort Supply to Dodge City, and from Fort Still to Henrietta, were therefore discontinued June 30, 1887, and a new transfer office was opened at Woodward, Ind. T., a station on the Southern Kansas Railroad, 14 miles south of Fort Supply. All of the iron poles and part of the other line material on these discontinued sections will be recovered and the remainder sold at auction.

The Fort Stanton section, 108 miles from Fort Stanton to Lava, N. Mex., is in good condition, and has required no general repairs. About 82 miles of this line is on iron poles.

The Fort Bridger section, 10 miles from Fort Bridger to Carter Station, Wyo., is entirely on iron poles, and has continued in excellent working order.

The Fort Union, Fort Wingate, Fort Lewis, and Uncompahgre (Fort Crawford) sections are short lines, mostly operated with telephones, and carrying no regular, paid, commercial business. The local control of these sections is in the hands of the post authorities.

Department of the Columbia and California.—Fort Klamath section, 233 miles from Fort Bidwell, Cal., via Fort Klamath, Oregon, to Ashland, Oregon. This line runs through densely timbered, mountainous districts, and requires more frequent and costly repairs than any other section. General repairs were made by troops during October and November, but the line needs an entire reconstruction on new poles to put it into a reasonably efficient condition. An additional repair station was opened at Bly, Oregon, with good results. It is intended to put from 1,000 to 2,000 new poles on this line, according to cost, during the present year, and by this means maintain it in operation until a special appropriation for its reconstruction can be secured.

Fort Canby section, 23 miles from Astoria, Oregon, via Fort Stevens, Oregon, to Fort Canby, Wash. This section had just been placed in excellent repair, when, on July 31, 1886, the submarine cable across the mouth of the Columbia River was broken by, it is presumed, a ship's anchor. Several fruitless and expensive attempts were made to recover and repair the cable, which was found to be so deeply imbedded in the sand as to resist all efforts made to raise it. As its final recovery appeared more than doubtful, a special appropriation of $5,000 was asked for to provide a new cable, but Congress saw fit to allow only $500 for another attempt to raise and repair the old one. As this sum was believed to be inadequate to have the work done by contract with private parties, the assistance of light-house tender *Manzanita* and of the engineer in charge of the Columbia River improvements, was asked for and promised, but neither could be obtained up to the close of the year. Proposals have now been invited from private parties to undertake the work for the sum appropriated, and if this fails the further action of Congress must decide whether or not telegraphic communication with Fort Canby shall be re-established. Since the break in the cable a display and vessel-reporting station has been established Fort Stevens, Oregon, which, to a small extent, performs the work formerly done by the Fort Canby Station.

Cape Flattery section, 80 miles from Port Angeles, Wash., to Tatoosh Island, Wash. The line runs through a densely wooded wilderness, and is therefore subject to many interruptions, caused by falling timbers and forest fires. The heavy submarine cable, 2 miles long, connecting Tatoosh Island with the mainland, failed on January 24, 1887, which was later discovered to have been caused by the cable chafing against the rocky bottom of the straits, near the land. An attempt made to raise the cable with ordinary appliances failed, and it was not until June 25 that successful repairs were made with the assistance of a steamer hired for the purpose and at a heavy expense. The land line having suffered considerably from the violent storms of the past winter and spring, will require extensive repairs before fall.

Spokane Falls section, 91 miles long at the beginning of the year, and extending from Fort Spokane, Wash., via Spokane Falls, Wash., to Fort Cœur d'Alene, Idaho, was shortened 30 miles through the abandonment and sale of the line between Spokane Falls and Fort Cœur d'Alene, on June 16, 1887. This action resulted from the opening up of private lines to Fort Cœur d'Alene. The line to Fort Spokane underwent an almost complete reconstruction during September, in order to have it follow the new stage road. About 1,000 new cedar poles were used in this work, and the line is in very good condition at present.

San Francisco Harbor section. The cable between Fort Mason and Alcatraz Island, which was reported broken in last year's report, has not yet been repaired. This is due partly to the fact that experience has proven this route to be unsuitable for a cable, owing to the constant danger of injury from ships' anchors, and partly because communication with Angel and Alcatraz Islands can be had over the remaining cables via the Western Union lines to Point Tiburon. Propsals have, however, been invited to raise and repair the broken cable with a view of using it in connection with the projected line to Point Reyes, Cal.

Department of Arizona.—Lieut. R. B. Watkins, Signal Corps, continued in charge of the lines in this department until relieved March 16, 1887, by Lieut. W. A. Glassford, Signal Corps, who still remains. The Prescott section, 280 miles (now 227 miles) and the Fort Apache section, 216 miles, are the principal lines in this department. Short telephone lines, operated by the post authorities, connect Forts Huachuca and Lowell with the nearest commercial offices. The Prescott section extended from Ash Fork via Whipple Barracks and Phœnix to Maricopa, Ariz., with branch lines to Forts Verde and McDowell. The completion of the Prescott and Arizona Central Railroad and construction of a commercial line from Prescott northward, led to the sale of the military wire between Whipple Barracks and Ash Fork on May 19, 1887. The iron poles will be recovered. Steps have also been taken to discontinue the military line between Maricopa and Phœnix at an early date, if approved by the Secretary of ar, as a commercial telegraph line is now under construction between those points.

The Fort Apache section extends from Fort Apache via Fort Thomas, Fort Grant, and Willcox to Fort Bowie, with a branch line from Fort Thomas to the San Carlos Agency. It is not probable that any portion of this section can be abandoned so long as the military posts remain. Iron poles are largely used and more will be supplied from the Prescott section. Both sections have worked with only occasional interruption, such as all telegraph lines are liable to. They have been of great military value during recent Indian troubles. The report of the officer in charge has not yet been received, but the lines are believed to be in excellent repair.

Department of Texas.—Lieut. L. E. Sebree, Signal Corps, remained in charge of the lines until May 1, 1887, when he was relieved on account of ill health. Since then the two sections have been under the local control of the chief operators.

The Brownsville section, 100 miles, extends from Rio Grande City (Fort Ringgold) along the Rio Grande River to Brownsville, with intermediate offices at the sub-posts of Edinburgh and Santa Maria. The line is kept in good condition, being almost entirely on iron poles, but is subject to frequent malicious damage by outlaws and other evil-disposed persons.

The Fort Davis section, 22 miles from Fort Davis to Marfa, is entirely on iron poles, and has been maintained in excellent condition throughout the year.

A short line operated by a Signal Corps operator, connects department headquarters with the Western Union office at San Antonio.

Department of the Platte.—The line from Fort Laramie, Wyo., to Fort Robinson and Crawford, Nebr., is at present the only military line in this department operated by the Signal Service. The extension of the Fremont, Elkhorn and Missouri Valley Railroad to and beyond Fort Robinson, led to the abandonment of the commercial line between Fort Laramie and Cheyenne, and necessitated connecting Fort Robinson with the commercial telegraph office at Crawford, Nebr., to provide a new outlet for the posts. The poles on this section are decaying rapidly and will soon have to be replaced. It is intended to supply iron poles as fast as they can be spared from other sections.

A new line is under construction in this department, from Fort Du Chesne, Utah, to Price Station, Utah, a distance of 87 miles. The wire, insulators, and brackets were supplied by this service from old and abandoned lines, and the poles were cut by troops. An expert Signal Corps lineman has charge of the work, which is now nearing completion.

Preliminary steps have been taken to have the Rawlings–Fort Washakie and Powder River–Fort McKinney lines, transferred to this service for maintenance and operation. It is hoped to have both lines in efficient working order by autumn.

The total receipts from commercial messages transmitted over the military telegraph lines during the year amounted to $12,654.67. In addition, $19,836.79 was collected at military offices for tolls due the connecting commercial lines.

The work of this division, as noted in the beginning of this report, consists almost entirely of auditing telegraphic accounts, and the regular duties of a telegraph office. There are 10 enlisted men in the division, 6 of whom are telegraph operators, and during the past fiscal year this entire force has been constantly overworked, owing to the various changes in the manner of auditing the bills of the Western Union Telegraph Company, and the various data called for by the Second Comptroller in this connection. For this the men of the telegraph division are entitled to especial credit.

The appropriations under my supervision as telegraph officer are the appropriations for telegraphing reports, $120,000 for the past fiscal year, and the appropriation for the maintenance and repair of sea-coast telegraph lines, $6,000, and the appropriation for military telegraph lines, $24,000. The appropriation of $120,000 for telegraphing reports was a reduction of $18,000 from that of the previous year, and it was owing to this reduction, and the failure of the deficiency bill, on the 1st of March, 1887, that quite a large amount of the telegraph work was discontinued; and in June, owing to some changes in the telegraphic cipher, it was found that quite a large portion of this work

could be resumed, and on June 10 almost all of it was resumed. It is believed that the appropriation for the ensuing fiscal year will cover all demands upon it, and will perhaps suffer a slight reduction. I would therefore recommend that for the fiscal year ending June 30, 1889, the estimate be for $132,000 instead of $138,000, as I believe for that year the telegraphic work of this service can be done for that sum. This reduction, however, should not be made in the event of Congress giving an increase in the cotton-belt appropriation, as then the sum of $6,000 would be needed for telegraphing those reports, and it would be well if an increased estimate is submitted for cotton-belt service, to include therein the sum of, say, $12,000, for telegraphing these reports, as a paid service gives far greater satisfaction, and better enables us to furnish the commercial public interested the full reports they so much desire.

In reference to the telegraph lines, the appropriation for the military lines can, for the fiscal year ending June 30, 1889, be very readily reduced to $20,000, as prospective reductions in the number of miles operated will enable us to maintain these lines for that sum.

In regard to the sea-coast lines, their present condition is most excellent, as shown above, and I recommend that the estimate for that appropriation be for only $4,000 for the fiscal year ending June 30, 1889, which sum, I am confident, will be about sufficient for their maintenance.

I desire to call the attention of the Chief Signal Officer to the fact that all the work performed by this service for the Army, in maintaining these telegraph lines, has never been fairly presented to Congress, or to the War Department. It is well known to the different division and department commanders in the Army, and while we in every instance use our utmost endeavors to give them every facility asked for, and oftentimes seriously embarrass the meteorological work of our service by putting most too many men on these lines, yet for this work the service never receives credit. I would therefore suggest that in your annual report you make special mention of these facts, to the end that at least from the War Department this service will receive proper credit for the work it performs.

F. R. DAY,
Second Lieutenant, Signal Corps.

WASHINGTON, *July* 1, 1887.

APPENDIX No. 10.

REPORT OF INSTRUMENT DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, July 20, 1887.

SIR: I have the honor to submit the following report of the instrument division during the year ending June 30, 1887:

This division was known as the physical laboratory up to August 2, 1886, on which date its denomination was changed to that of the instrument division. Prof. T. C. Mendenhall was in charge of the division up to October 30, 1886, and on that date was relieved by First Lieut. T. M. Woodruff, Fifth Infantry, A. S. O. and assistant, who continued in charge until June 1, 1887, when the writer was put in charge, relieving Lieutenant Woodruff.

The principal duties of the division consist in the supervision of the exposure of instruments; the current barometric work of the office; the establishment and supervision of stations for the study of atmospheric electricity; the study of new methods of self-registering instruments without the aid of photography; experiments upon ground connection for lightning-rods, and the best methods of protection from lightning; observations and experiments upon ground temperature; experiments and efforts to establish a normal barometric standard; a study of the ordinary signal service barometer; experiments with the anemo-barometer; the study and investigation of a standard of anemometry and experiments to devise a method of obtaining the vertical component of the velocity of the wind; the study of solar radiation and the use of the actinometer; and the study and investigation of an apparatus for observing and recording the motion of clouds.

The division is also charged with the custody of all meteorological instruments; their inspection after purchase, comparison, examination, and repair; the preservation and comparison of all standards and substandards; the conduct of a system of measurements of atmospheric electricity, ground currents, and earth temperatures; the testing and corrections for all instruments issued for use on Signal Service stations, together with the consideration of all special subjects involving experimental research or measurement.

Prof. Thomas Russell and Prof. C. E. Marvin have remained on duty in the division during the year.

In the care of instruments to prevent loss or damage, constant vigilance is exercised and they are often counted and checked, and statements of those received and issued made.

As soon as instruments are received from the manufacturer they are carefully inspected, entered in a day-book by number and kind, and submitted to a rigid comparison with standards. Instruments received back from stations are stored if serviceable; if unserviceable are repaired, tested, and kept for reissue. When any instruments are issued from the division, a complete record is kept and a history of the issue, and all the details always readily accessible.

All thermometers are examined, tested, and compared in bunches of six; tests made at freezing point, scales read with magnifying glasses, and readings noted. They are then tested at a temperature of 42° with a standard thermometer, and in like manner for every 10° up to 112°, and at intervals of 20° below 32°, down to—28°.

The proper corrections are calculated and recorded on a card for future use, which shows the date on which the tests and comparisons were made.

Instruments with defects are rejected. Special comparative readings of barometers are made when required, and comparative readings of the substandards and stations barometers are regularly made and recorded.

Aneroid barometers are compared by being put in receiver, air exhausted, and then allowed to re-enter slowly. The readings of a mercurial gauge connected with the receiver are then compared with the readings of the aneroid and the differences noted as corrections. These comparisons are generally made at temperature 0° F., 62° F., and 95° F.

Barometers which are unserviceable are repaired. They are taken apart, cleaned, and carefully examined. Scales and verniers are repolished, damaged parts, such as tubes,

clamps, screws, cisterns, bags, etc., are replaced, and the whole instrument made "mercury tight." They are then compared with the standard.

Thermometer scales are cleaned and resilvered.

Mercury is redistilled in a very careful manner in order to render it pure enough for barometric purposes.

Barometer tubes are carefully filled by the boiling process.

The care of the sixteen self-recording instruments requires repairing, cleaning, and adjusting in the instrument room, and each is timed and checked daily. These instruments are exhibited and their action explained to visitors.

The records of all, with the exception of the Swiss ombro-anemograph and Hough's meteorograph, have been compared with those of non-registering instruments and the sheets filed away for future use.

All anemometers received are tested and rigidly compared before being issued to stations.

The total number of instruments received during the year was 2,366, classified as follows:

Barometers	144
Thermometers	1,502
Rain and snow gauges	266
Wind-vanes	84
Anemometers	139
Anemometer self-registers	31
Anemometer supports	17
Whirling psychrometers	146
Clocks	37

The number of instruments issued to stations of the service and to voluntary observers was 2,115. These are classified as follows:

Barometers	129
Thermometers	1,207
Rain and snow gauges	435
Wind-vanes	89
Anemometers	76
Anemometer self-registers	42
Anemometer supports	32
Whirling psychrometers	75
Clocks	30

In addition to this, 266 instruments were received, examined, compared, and tested before being issued to private persons. During the year 120 barometers were repaired and 137 barometer tubes boiled and filled.

An iron barometer cistern has been devised by Private Tuch, on duty in the instrument room, which was submitted for examination and approval, and if adopted will secure greater durability and simplicity in the method of cleaning barometers.

A device for automatically marking every 10 miles of wind on the record-sheet of the anemometer, by Private Tuch, was also submitted for examination and approval.

The observation and experiments upon atmospheric electricity were carried on in the usual manner. Simultaneous observations were frequently made at the top of the Washington Monument and the instrument room of the Signal Office. Reports of observations were also received from electrical stations at Boston, Mass.; New Haven, Conn.; Ithaca, N. Y.; Columbus, Ohio, and Terre Haute, Ind.

Extracts from these observations and notes on results have been published in the Monthly Weather Review during the year.

Six new electrometers of improved patterns were received from the Electric Manufacturing Company, but were found to require new glass parts of greater insulating power, to obtain which required a long delay.

The electrical stations were supplied with these new electrometers as soon as practicable. Experiments made in the physical laboratory of the division led to great improvements in the suspension of the electrometer needles, and the instruments now in use are believed to be more reliable and uniform in their indications than any used heretofore.

A special form of photographic self-register was devised and constructed by Professor Marvin and is thought to be peculiarly adapted to the continuous registration of the electrometer.

The preliminary experiments with resistance thermometers for the measurement of earth-temperatures were completed early in the year, and detailed drawings and specifications by Professor Marvin of the sets of the apparatus submitted.

In due time the instruments were received, and after careful examination found to be highly satisfactory. The necessary adjustments to standard, and other preparations of

the apparatus for use, were made, and one set, with several thermometers, was sent to Terre Haute, Ind., where the first experiments and measurements of underground temperatures were made.

A delicate seismograph was set up in the laboratory, and by electrical devices was made to stop a clock, and thus accurately record the time when the instrument was affected by earth-tremors.

Professor Marvin correctly timed two or three earthquakes by means of the apparatus. Subsequently one other instrument was placed in the electrical station at Terre Haute, Ind. These two are the first and only instruments of this kind kept in operation in the United States.

Many tests of samples of telegraph wire for military field lines have been made in the laboratory during the year, and the necessary preparation of instruments and apparatus was made for testing the Block Island and Cape Charles and Cape Henry submarine cables.

During the year, under the immediate supervision of Professor Russell, 1,281 Signal Service thermometers were compared with the standard instruments, and 269 thermometers were tested and compared for voluntary observers and other persons.

Ten aneroid barometers were tested and their corrections determined for pressures from 14 inches to 31 inches, and for temperatures 30 degrees apart from 0° F. to 90° F.

Two hundred and seventy-two rain-gauges were numbered and calibrated.

The old Kew pattern barometer was fitted with a new tube with an internal diameter of 1.2 inches. It was altered and arranged to read according to the collimation method devised by Marek. The top of the mercurial column is located by readings of a cathetometer telescope on the direct image of a set of cross-wires in a collimator and their reflection from the mercurial surface of the top of the column. A brass bar to serve as a scale for this barometer was inlaid with silver, and was graduated to millimeters. The graduation corrections of this bar were determined by comparisons made with a standard half-meter bar made by Professor Rogers.

The coefficient of expansion of the brass bar was determined by comparing it at a temperature of about 22° C., and also when packed in melting ice with a steel bar 1 meter in length kept at a constant temperature of 0° C. by being packed in melting ice.

The vacuum correction of the instrument was determined by Arago's method of varying the size of the vacuum-chamber and making simultaneous readings with another barometer, and also with the size of the vacuum-chamber kept unchanged. A series of comparisons was made between the Signal Service working standard barometer (Adie No. 1526) and this Kew pattern instrument. The results showed that Adie No. 1526 with a correction of + .002 of an inch applied, read 0.004 of an inch higher than the Kew pattern barometer after correction for errors of scale graduation, etc.

The method of locating the surface of mercury in the cistern of the Kew barometer by readings of a cathetometer telescope on a set of cross-wires partially immersed in the mercury and on their reflection from the surface does not prove entirely satisfactory, but the main defect of the instrument is that its vacuum correction can not be easily determined.

Professor Russell has adopted a new design for a normal barometer, in which the size of the vacuum can be changed quickly and the surface of the mercury in the cistern located by a collimator in the same way as the top of the column.

Some progress has been made in the construction of the cistern for this barometer, which is entirely of glass.

The comparative readings of the still and whirled psychrometers made at stations were collated and reduced, and a report on the differences was submitted.

For one day in each month in the year the traces of the self-registering instruments in the instrument room of the Washington Station, were compared with the meteorological record as a check on their working.

The comparative readings of the "extra" and "station" barometers at Signal Service stations made on the last two days of every month were tabulated, and numerous suggestions, based on these comparisons, were made relative to changes in the corrections of the barometers, corrections of their back records, and the repair, cleaning, and calling in of the instruments.

Numerous letters were prepared in answer to correspondents, giving information about methods of measuring humidity, about self-registering instruments, the corrections of barometers, thermometers, etc.

Comparisons were made on the last two days of every month of three substandard barometers in the testing-room.

Plans and detailed specifications were drawn up for various instruments, thermometers, self-register for anemometers, barometers, mercurial gauge for aneroid comparator, comparator for thermometers at low temperatures, comparator for thermometers at temperatures from 32° to 100° F., etc.

Board meetings were attended on the proposed changes in the form of thermometers in use, on the new support for rain and snow gauges, and on the best form of anemometer for use by the service.

All correspondence relative to the purchase of instruments which may be required is referred to the division for recommendations and remarks, and all communications referring to the establishment of volunteer stations of observations and the supply thereof with instruments, are acted upon by the officer in charge as a member of the "loan board."

There is a pressing need of a building in which the work of the division can be concentrated, as the distance apart of the physical laboratory, the instrument room, the testing room, and the store-room causes delay in the transaction of business, and requires an extra messenger.

Very respectfully, your obedient servant,

JOHN C. WALSHE,
Second Lieutenant, Signal Corps, Assistant in charge Instrument Division.

The CHIEF SIGNAL OFFICER.

APPENDIX No. 11.

REPORT OF EXAMINER'S DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, July 8, 1887.

SIR: In accordance with instructions contained in Memorandum No. 82, dated Signal Office, June 28, 1887, I have the honor to submit the following report of the operations of the examiner's division for the fiscal year ending June 30, 1887.

At the close of the last fiscal year the division was under the charge of Second Lieut. Frank Greene, Signal Corps, U. S. Army, who so continued until August 12, 1886, when he was relieved by First Lieut. R. E. Thompson, Sixth U. S. Infantry, acting signal officer, by virtue of Instructions No. 43, dated Signal Office, August 12, 1886. Lieutenant Thompson continued in charge of the division until May 1, 1887, when he was, under the provisions of Instructions No. 25, dated Signal Office, April 28, 1887, relieved by myself.

The working force of the division consists of three clerks and a messenger. There have been no changes in it during the year except the detail of a man, on two or three occasions, to assist during a heavy press of work.

All letters of authority for purchases and expenditure of money have been carefully scrutinized previous to approval, to see that they were legal, proper, and correct in form. And when, in the opinion of the examiner, they were not so found they were returned to the source from whence they came, with the objections stated in writing. All vouchers for purchases and expenditures of the property and disbursing officer have been audited and approved previous to payment, or, where irregularities or inaccuracies have been found, have been returned for correction or adjustment, as the circumstances of the cases required. A thorough and complete examination of all money accounts and property returns pertaining to the service has been made before forwarding them to the Third Auditor of the Treasury, none of which, however, were permitted to go forward until after all differences found had been adjusted; in fact, a general control under the law and the regulations of the War and Treasury Departments, has been had of all fiscal operations of the service where the disbursements have been made by the officers of the Signal Bureau.

The close scrutiny observed of all accounts or proposed expenditures of money has been with a view to prevent irregularity or illegality, and to secure to the service the greatest possible economy.

In addition to these, a complete record of all letters received, letters of authority issued, vouchers audited, and money accounts and property returns examined and transmitted to the Third Auditor of the Treasury for settlement, has been kept, showing the history of each transaction from its authorization to its final disposition.

The correspondence connected with the adjustment of money and property accounts has been large and has involved much labor in the prosecution of this branch of the work.

The amount of work performed during the year is briefly set forth in the following summary:

SUMMARY.

	1886.						1887.						
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Returns of signal equipments and stores examined and forwarded to U. S. Treasury	87	92	......	84	51	35	103	81	96	79	50	74	†832
Letters sent in connection with the examination of money accounts and property returns	219	253	26	221	147	80	262	215	231	178	157	196	2,185
Letters received and recorded	276	165	141	261	160	146	317	137	170	261	147	136	2,317
Letters of authority for purchases and expenditures received, examined, and recorded	136	287	230	285	224	274	216	141	154	156	139	351	2,593
Purchase vouchers audited and recorded	99	48	77	59	66	187	68	98	130	68	78	71	1,049
Expenditure vouchers audited and recorded	580	510	631	211	560	592	415	610	482	550	354	452	5,947
Accounts current, line receipts, examined and disposed of	2	4	......	......	7	......	1	8	16	1	23	21	†83
Accounts current of property and disbursing officer for appropriations, examined and forwarded to U. S. Treasury	......	......	3	......	......	......	3	......	3	......	......	1	†10
Accounts current for sales at auction examined and forwarded to U. S. Treasury	......	1	......	......	1	......	1	......	......	......	......	......	3
Weekly and monthly statements of public funds recorded and verified	12	29	33	17	32	20	23	26	20	23	65	27	327
Errors, irregularities, and differences discovered	(*)	49	37	94	117	176	119	101	183	69	83	180	1,208
Office memoranda written in regard to the work of the division	(*)	65	73	145	143	81	80	61	55	58	26	88	875

* No record kept prior to August 18, 1886.

† These figures do not, however, altogether represent the actual number of papers handled, as in nearly every instance the accounts and returns are accompanied by numbers of vouchers and subvouchers, varying from one or two to several hundreds, as in the accounts of the property and disbursing officer, which have varied from about five hundred to about nine hundred each, and have aggregated 6,103 for the ten accounts-current of that officer examined and forwarded to the Treasury during the fiscal year.

As will be seen by the foregoing, the volume of papers passing through the division has been extremely large, and has taxed the energies of the three clerks employed therein to the utmost to handle it properly; but by unremitting labor, with material assistance from the messenger, who, when not employed on messenger duty, has performed the duties of a clerk in a satisfactory and acceptable manner, this has been done and the work kept up to date as nearly as the nature of money and property accounts will permit, except in case of accounts current for line receipts on United States military telegraph lines, which, notwithstanding the best endeavors to keep them examined up to date, have gradually fallen behind and are now, in some instances, eight and ten months in arrears. It is, however, hoped and expected that these will, during the coming fiscal year, be brought up to date and so kept in the future.

In conclusion, I have the honor to say that it affords me great pleasure to especially commend for faithfulness in their work during the time I have been in charge of this division Sergeant James B. Newlin, chief clerk; Privates C. P. Cronk and J. W. Rennie, and Mr. Zeph Fenno.

I am, sir, very respectfully, your obedient servant,

THOS. M. WOODRUFF,
First Lieutenant, Fifth Infantry, Acting Signal Officer, and Assistant in charge of Examiner's Division.

The CHIEF SIGNAL OFFICER.

APPENDIX No. 12.

REPORT OF THE OFFICER IN CHARGE RECORDS DIVISION.

SIR: In compliance with instructions, I have the honor to make the following report of work done in the records division, from the date of its establishment, March 1 to June 30, 1887.

The following tables, eleven in number, published in the Weather Review, have been prepared and furnished monthly to the review division:

Table No. 1.—Miscellaneous data from Signal Service stations.
No. 2.—Table of monthly snowfalls.
No. 3.—Table showing the amount of snow on the ground at the end of the month.
No. 4.—Table of water temperatures.
No. 5.—Table showing heights of rivers above low water.
No. 6.—Table of winds exceeding 50 miles an hour, other than maximum velocities.
No. 7.—Table of comparative maximum and minimum temperatures.
No. 8.—Table of rainfalls exceeding 2 inches.
No. 9.—Table of normal pressure.
No. 10.—Table of normal temperature.
No. 11.—Table of normal precipitation.

The following tables have also been prepared for the review division:

Tables of mean monthly humidity, average cloudiness, total wind movement, and total precipitation for each month of the year for eleven years at 174 stations. Also tables of average monthly humidity, average monthly cloudiness, and average total monthly movement of wind, computed from opening of station the end of 1886 at 174 stations.

DATA FURNISHED INDICATIONS DIVISION.

Tables of normal pressure, temperature, and precipitation have been prepared and furnished monthly to the indications division, with tables of normal temperature and precipitation for winter and spring.

Professor Carpmael, Toronto, has been furnished monthly tables of normal a. m., p. m., and midnight pressure and temperature for all stations.

Engineering News has been furnished monthly with a table containing data of temperature, wind, and precipitation from certain specified stations.

Tables of daily normal temperature and precipitation have been prepared for all stations of the second order except a few for which the available records were not sufficient to enable this to be done. Exclusive of the work of preparing the tables, a great deal of work has arisen in connection with these normals.

The different stations having been required to verify the temperature tables and report all errors discovered, it was soon found that the forms (No. 134) from which the normals had been prepared required very extensive corrections, which necessitated a great deal of correspondence with stations. In this connection several hundred letters, most of them containing inclosures for examination, were referred to this division, so that the work of verification of normals is about half completed for all stations. In connection with this was the work of examining reports on "constants," etc.

All reports of this character from March to May, inclusive, were examined, corrections made, and, when necessary, instructions given for the proper manner of preparation.

Duplicate copies of normal precipitation tables and of normal temperatures of May, June and July, for all stations, and duplicate copies of normal temperature of 35 selected stations for all months, were furnished the stations division.

Copies of Fort Sully Form 113 for three months were also made for stations division.

A table showing number of signals ordered, number ordered late, numbered verified, per cent. of verification, and number of storms without signals, from January, 1880, to and including March, 1887, for the Chief Signal Officer.

Prepared for indications officer, table showing number of times the maximum velocity of the wind equaled the present verifying velocity, with the direction, at all stations displaying cautionary signals on the lakes and gulf and Atlantic coasts, for June and July, 1886, and a chart showing mean surface temperature of water at 38 stations for June and July, 1886.

DATA PREPARED FOR USE OUTSIDE OF OFFICE OF THE CHIEF SIGNAL OFFICER.

Seventy-seven requests of all kinds have been filled for use of parties outside of this office, sixteen being certified under seal of the War Department.

WORK DONE ON RECORDS FOR FILE.

The following work has been done on records for file:

Missing data entered on 3 a. m., 10 p. m. charts, and charts completed for the first 10 days of April, 1887.

Data entered on Form 134 would equal to 1,714 months' record, and data computed that of 1,666 months.

In the various forms of records 3,592 corrections have been made.

Computed table of monthly and annual precipitation for all stations for 1886.

Entered and computed table of total monthly wind movement for all stations, September to December, 1886, inclusive.

Table of monthly mean dew-point computed for all stations for 1886.

Entered in mean book sums and means of all elements of weather for February, March, and April, 1887.

Means of 7 a. m., 3 p. m., and 11 p. m. temperatures, computed for all stations for the last six months of 1886.

Monthly range of barometer entered and sums and means, computed for all stations for the last four months of 1886.

Entered in table showing number of times wind was observed blowing from eight principal points, data of all stations for 1886.

Entered maximum and minimum temperatures of third-order stations for last four months of 1886.

Entered in table showing number of clear, fair, and cloudy days, data of 125 stations, September to December, 1886, inclusive, and computed percentages.

Entered in table showing average number of days on which .01 inch precipitation occurred, data of 60 stations, October to December, 1886, inclusive.

Computed sums and means in table of average cloudiness for all stations, October to December, 1886, inclusive.

Computed for all stations, October to December, 1886, inclusive, sums and means in table of lowest barometers.

Table of mean maximum and minimum temperatures, data entered and computed for all stations for 1886.

Table of temperature and precipitation at post hospitals, data entered for 1886, 68 stations.

Entered in table showing temperature and precipitation record of voluntary stations, data of 324 stations, and computed sums and means, October to December, 1886, inclusive.

TABLES FOR ANNUAL REPORT OF CHIEF SIGNAL OFFICER.

Table showing hourly velocity of the wind, entered and computed for all stations for 1886.

Table showing precipitation at cotton-region stations, April to October, 1886, inclusive, data entered for 137 stations.

Table showing maximum velocity of wind for each month, data entered for all stations for 1886, made in duplicate.

Table showing number of clear, fair, cloudy, and rainy days for each month, data entered for all stations for 1886.

Table of mean maximum and minimum temperatures, data entered for all stations for 1886.

Table showing daily range of temperature, data entered for all stations for 1886.

Table showing monthly average cloudiness, data entered for all stations for 1886, made in duplicate.

Table showing monthly maximum and minimum temperatures and precipitation at third order stations, data entered for all stations for 1886.

Table showing monthly mean relative humidity at all stations for 1886, made in duplicate.

Table showing monthly maximum and minimum and annual range of temperature at 300 voluntary stations.

Table of monthly mean temperature for 300 voluntary stations, made in duplicate.

Table of monthly and annual precipitation at 300 voluntary stations.

Table of monthly maximum and minimum temperatures at 67 post hospitals.

Table of monthly and annual mean temperatures at 67 post hospitals, made in duplicate.

Table of monthly and annual precipitation at 67 post hospitals.

Table showing dates of first killing frost at 112 stations, east of the Rocky Mountains.

Table showing dates of first snow at 112 stations, east of the Rocky Mountains.

Table showing dates of opening and closing of navigation at 39 stations, season of 1886-'87.

Table showing normal precipitation for each month and the departure of precipitation of each month of 1886 therefrom for all stations.

Table of mean a. m., p. m., and midnight temperatures at all stations for each month, computed from commencement of observations to the end of 1886.

NEW FORMS PREPARED.

Thirty different kinds of forms were prepared, and a total of 2,370 copies made.

FILING AND REINDEXING VOLUNTARY AND POST HOSPITAL RECORDS.

Records of ten months were filed in books, and the original indexing of 165 volumes of voluntary and post hospital reports was carefully gone over and errors corrected.

This involved the examination of every page in each of the 165 volumes to see that it was given its proper place in the original index. When this was completed the names were transferred from the old index books to the new, one volume being used for each State, so that it was necessary to go over the old volumes very many times in order to select the stations by States. This was nearly completed for all States to the end of 1885.

FILING REGULAR RECORDS.

All the various forms of meteorological record from regular stations, or of matter pertaining thereto, have been properly filed as received. This includes the examination of newspapers received from stations and the preparation for the binder of those records that are made up in volumes. The records were all transferred to one building (excepting original records) and rearranged, and in many cases relabeled, so that they were made comparatively easy of access. Numerous requests for records from different divisions of the office were made and filled.

LETTERS.

Exclusive of those relating to tornadoes and cablegram service (mentioned under those heads) 117 letters were received and 128 sent.

PROOF READ.

Proof of 103 pages of annual report was read and revised.

MISCELLANEOUS.

Verification of several tables prepared at stations for publication.

Discussion and letter regarding moon and weather for review.

SUBDIVISION OF TORNADOES.

On the organization of the records division, March 1, 1887, the subject of the tornadoes studies was made a part of this division, but the following report dates from June 30, 1886:

A large part of the work of this subdivision consists in the collection of data relative to tornadoes and other violent local storms, and the abstraction of such portions of the data as are desired for record and study which are entered in the tornado books, kept in this division.

In the prosecution of the work 1,276 detailed reports of the occurrence of tornadoes or destructive storms have been received, and in connection therewith 2,830 communications were sent and 1,066 received.

From newspapers and other sources information was received of the occurrence of tornadoes in certain localities, and 1,537 letters of inquiry were sent to persons living in the vicinity of the path of the tornado or storm, requesting detailed information in regard to the same.

The names of 889 observers have been added to the list of tornado reporters, making the total number of tornado stations throughout the country 2,376.

These reporters are supplied with the necessary blanks, circulars, and envelopes to enable them to render reports to this office.

Two thousand one hundred and twenty-three newspapers were examined for record of meteorological phenomena, and a large number of clippings, not of a tornadic nature, were turned over to the officer in charge of the review division.

A brief summary of the results of study and investigation of the occurrence of tornadoes was prepared at the expiration of each month for publication in the Monthly Weather Review. A compilation of these summaries presenting the most important points in the work accomplished during the year is given in the following table:

SUMMARY.

Place and month.	Day.	Time.	Direction.	Form of cloud.	Width of path.	Total valuation of property destroyed.
July, 1886.					*Feet.*	
Florence, S. C	1			Funnel		Light.
Dallas, Mo	8	5.30 p. m	SE.	....do		Do.
Middletown, Ky	8	6 p. m		....do		Do.
Sleepy Eye, Minn	9	12.30 a. m		....do	75	Great.
Bloomington, Ill	9	7.30 p. m	S.	....do		Do.
De Leon and Mooresville, Tex.	12	Afternoon				Do.
Millbrook, Pa	13	Night		Funnel	45	Light.
Newark, Ohio	14	2.30 a. m	N.	....do		Great.
Barnesville, Ohio	14	2.30 a. m	NE.	....do	150	Do.
Lunenburgh County, Virginia.	18			....do	90	Considerable.
Petersburgh, Dak	23	4.30 p. m	E.	....do	60	
Great Barrington and Leominster, Mass.	30			....do	75	Considerable.
Potaskola, Allentown, and Vaughnsville, Ohio.	30	10.40 a. m	E.	....do	150	Considerable.
Wethersfield, Conn	30	5 a. m	SE.	....do		
Wethersfield, Vt	30		SE.	....do	75	$20,000.
August, 1886.						
Leipsic, Ohio	1	2.30 p. m	SE.	Funnel		
Battle Creek, Mich	1	10 a. m				Considerable.
Hartland, Kans	5	Evening				Great.
Beaudry, Minn	9	2.45 p. m	E.			
Near Aberdeen, Dak	11	Morning				Considerable.
Attica, Ind	12	8.15 p. m				$1,700.
Newburgh, Ind	14	5 p. m				Great.
Dalton, Albert Lea, and Breckenridge, Minn.	15	Evening				Considerable.
La Moure, Fort Abercrombie, Wild Rice, Hickson, Brampton, and Newark, Dak.	15	6.30 p. m	ESE.	Funnel	10,560	Great.
Wyoming, Warsaw, Martinsville, and Castil, N. Y.	16	3.30 to 4 p. m.	NE.	....do		Considerable.
Agency, Mo	17	6 p. m	E.			
Edmont, Tex	18	3 30 p. m				Small.
Buffalo, Cochran's Mill, Cokato, and Keystone, Minn.	21	5 p. m	NE.	Funnel		Considerable.
Enderly, Minn.	21	4.20 p. m				Do.
Lyons Station, Connersville, and Quakertown, Ind.	22	3.25 p. m	SE.	Funnel	600	
San Antonio and Comanche, Tex.	24	5 p. m		....do		
September, 1886.						
Ellington and near Burnside, Conn.	12	7 p. m	N. 30° E.	Basket	160 to 330	$25,000.
Jersey City, N. J., Flushing, and Brooklyn, N. Y.	12	6 p. m	NE.	Funnel		
Onancock, Va	12	8 p. m	NE.	....do	40 to 250	Very destructive.
Shelbyville, Ill	16	11 a. m	NE.	....do		Do.
Seymour, Ill	16	4 p. m	ESE.	....do		
Near Springfield, Ill	16	4 p. m	NE.	....do		Slight.
Tolono, Ill	16	4 p. m	NE.	....do		
Savoy, Ill	16	4 p. m	NE.	....do	660	$2,500.
Sylvania, Ind	16	11.35 a. m	NE.	....do		
Three miles south of Covington, Ind.	16	4 p. m	NE.	....do	Narrow	
Terre Haute, Ind	16	11.30 a. m	NE.	....do		$135,000.
Dundee, Ind	16	8.15 p. m	E.	....do	2,640	
Alamo, Mich	16	1 p. m	E.	....do	Narrow	
Diamondale, Mich	16	12.30 p. m	NE.			
Brady and Wakeshama, Mich.	16	Noon	NE.			Considerable.
Shephardsville and Saint John, Mich.	16	....do	NE.	Funnel		Do.
Victor Township, Michigan	16	....do	E.			Do.
Howell, Mich	16	1 p. m	NE.	Funnel		Great.
Brighton, Mich	16	....do	NE.			$6,000.
Near Wakelee, Cassopolis, Barron Lake, Penn, and Marcellus, Mich.	16	10.30 a. m	N 30° E.	Funnel		
Rice Creek, Mich	16	11.30 a. m	NE.	....do	660-1,320	Considerable.
Brooklyn, Mich	16	1 p. m	E.	....do		

SUMMARY—Continued.

Place and month.	Day.	Time.	Direction.	Form of cloud.	Width of path.	Total valuation of property destroyed.
September, 1886—Cont'd.					*Feet.*	
Bath Mills, Mich	16	1 p. m	NE.			Great.
Joliet, and 9 miles southeast of Plainfield, Ill.	18	7.15 p. m	NE.	Funnel	50-300	$75,000.
Buffalo, Mo	18	Morning	NE.			Very destructive.
Sentinel Prairie, Mo	18	3.30 p. m	NE.	Funnel	2,640-6,600	
October, 1886.						
Near Cape Hatteras, North Carolina.	1	Afternoon	E.	Funnel		
Clinton, Mich	14	2 p. m	NNE.	....do		Very destructive.
November, 1886.						
Panamint, Cal	14	9 p. m	NE.	Whirl		
Chambersburgh, Pa	18	Morning	NE.	Funnel		Considerable.
Luzerne County, Pennsylvania.	18	....do	NE.			$75,000.
January, 1887.						
Sims' Chapel, Ala	13	a. m	NE.	Funnel	1,320	Great.
Chapel Hill, Tenn	13	6 p. m	NE.	....do	1,320	Do.
Near Greenbrier, Tenn	13	....do	E.	....do	1,320-2,640	Very destructive.
Brookston, Tex	22	7 p. m	NE.	....do		Do.
Near Brazos, Tex	22	4 a. m	NE.	....do	2,640	Do.
Anderson's Mill, S. C	23	Afternoon	E.	....do		Do.
Near Fairview, S. C	23	....do	E.			Do
Graham, N. C	24	Morning	E.		1,320	
Near Catawba, N. C	25	4 a. m	NE.		600	
Pultneyville, N. Y	30	5 p. m	NE.	Funnel	600	
20 miles west of East Otto, N. Y.	30	4.20 p. m	NE.	....do	Narrow	
Burnt Factory, S. C	30	9 p. m	NE.		....do	Considerable.
February, 1887.						
Kilburne, Ohio	10	7.20 a. m	NE.			
Neshannock and Mercer, Pa.	11	11 a. m	NE.		1,320-2,640	Very destructive.
Huntington, Pa	11	Noon	NE.			Do.
Tyrone, Pa	11	....do	NE.			Do.
Greenburr, Pa	11	11 a. m	NE.			Do.
Tionesta, Pa	11	....do	NE.		Narrow	Do.
Canton and Louisville, Ohio	11	Morning	E.	Water-spout.	2,640	$100,000.
Akron, Ohio	11	....do	NE.		Narrow	Very destructive.
Vannattasburg, Ohio	11	....do	NE.		....do	Do.
Carroll and Lithopolis, Ohio	11	7.45 a. m	NE.		2,640-3,960	Do.
Centreburgh, Ohio	11	8 a. m	E.		Narrow	Destructive.
Lancaster, Ohio	11	9 a. m	NE.		...do	Very destructive.
Wellsville, Ohio	11	Morning	NE.		....do	Do.
Mount Hor, Ky	11	6 p. m	NE.	Funnel	2,640	Do.
Factoryville, N. Y	11	11.30 a. m	E.	....do	150-1,720	Do.
Lowmanville and Wellsburgh, N. Y.	11	....do	E.	....do	2,640	
Near Midway, Md	11	1.15 p. m	NE.		Narrow	
Shelbyville, Ind	11	4 a. m	NE.	Funnel		
Near Colorado Springs, Colo.	16	3 p. m	E.		Narrow	
Athens, Kans	17	2 p. m	E.			Very destructive.
Cuthbert and near Fort Gaines, Ga	18	Afternoon	NE.	Funnel	1,320-2,640	Do.
Near Oroville, Cal	21	Evening	NE.		40	Do.
Eatonton, Ga	26	4.15 p. m	NE.	Funnel	150-230	Do.
Near Worthville and Jackson, Ga.	26	4 p. m	NE.	....do	600-1,320	Do.
Elk Creek, Ky	26	9 a. m	NE.		Narrow	Do.
Wallace, La	26	11.50 a. m	E.		....do	$15,000.
Tyler Creek, W. Va	26	5 p. m	NE.			
March, 1887.						
Tampa, Fla	17	5 p. m	NE.		Narrow	$10,000.
Topin's Grove, W. Va	24	4.30 p. m	NE.	Funnel	1,720	
Burton, W. Va	24	6.30 p. m	NE.			Very destructive.

SUMMARY—Continued.

Place and month.	Day.	Time.	Direction.	Form of cloud.	Width of path.	Total valuation of property destroyed.
March, 1887—Cont'd.					Feet.	
Hockingport, Ohio	24	4 p. m	NE.			
Vinton, Ohio	24	5 p. m	NE.			
Point Pleasant, W. Va	24	...do	NE.		Narrow	Very destructive.
Tyler Creek, W. Va	24	...do	NE.		...do	Do.
Ripley, W. Va	24	6 p. m	NE.		...do	$2,800.
Lincoln, Ohio	24	Evening	NE.		...do	Great destruction.
Murraysville, W. Va	24	4 p. m	NE.	Funnel	...do	
Evergreen, Ohio	24	5 p. m	E.			Considerable.
Roney's Point, W. Va	24	5.30 p. m	NE.		Narrow	Do.
Pilot Point, Tex	26	...do	NE.		...do	Very destructive.
Bigbyville, Tenn	27	4.30 p. m	NE.		90	Do.
Barton, Ga	31	6 p. m	NE.	Funnel	600–900	Considerable.
April, 1887.						
Ackworth, Ga	3	8.30 p. m	E.			
Beaudry, Minn	9	4 p. m	NE.	Cone	Narrow	Great.
Fairport, N. Y	15	5 p. m	E.	Funnel	...do	
St. Clairsville and Martin's Ferry, Ohio	15	3.20 p. m	NE.	...do	90–600	$250,000.
Pittsborough, N. C	18	Noon			1,200	
Myrtle Station, Va	18	6.30 p. m	NE.	Funnel	300–600	Great.
Jonesborough, Ala	18	3 a. m	NE.	...do	Narrow	Considerable.
Ridgedale, Tenn	18	4.30 a. m	NE.	...do	...do	$10,000.
Prescott, Kans	21	5.30 p. m	ENE.	...do	600–2,640	$1,000,000.
Blossom Prairie, Tex	22	8.30 a. m	NE.		Narrow	$4,200.
Carmi, Ill	22	11.45 p. m	NE.		...do	
Millport, Ala	22	6 p. m		Funnel	900	
Near Cave Spring, Ga	22	8 p. m	E.		300	Considerable.
Atchison, Kans	22	2.30 p. m	SE.			
Near Yates Centre, Kans	22	Morning				
Buena Vista, Ind	22	6.30 p. m	NE.	Funnel	375–2,640	
Paris, Ky	22	8 a. m	S. 53° E.		900–1,200	Do.
Huntingdon, Miss	22	4 p. m	NE.		Narrow	
Near Mt. Carmel, Ill	22	6 p. m	NE.	Funnel	210–1,320	$50,000.
Near Clarksville, Ark	22	6.30 a. m	ENE.	...do	300–900	$150,000.
Evansville, Ind	25	10 a. m	NE.	...do	90–120	Considerable.
Chatham and Wake Counties, North Carolina	25	Noon	NE.	...do	900–1,200	Do.
Near Wade's Mill, Ky	28	Afternoon	SE.		Narrow	
Soapstone Mount, N. C	28	4.30 p. m	E.		...do	
Fort Sill, Ind. T	29	8 p. m.	NE.	Funnel	7,920–10,560	
Walnut Springs, Tex	29	9 p. m	SE.		Narrow	
Du Quoin, Ill	29	6 a. m	E'ly.	Funnel	180 to 210	
Mossville, Tex	29	9 p. m	NE.			
Near Cleburne, Tex	30	1.30 p. m	SE.		Narrow	
May, 1887.						
Fergus Falls, Minn	1	4.30 p. m	E.			
Neillsville, Wis	1	9 p. m	NE.			
Rollay, Minn	1		NE.	Funnel		
Wauseon, Ohio	2	12.35 p. m	N. 20° E.	...do	Narrow	$1,500.
Milltown, Wis	1	6 p. m	NE.		40	Considerable.
Saint Paul, Minn	1	6 p. m	NE.			$15,000.
Bagley, Mich	2	3 p. m	NE.			Very destructive.
Vanlue, Ohio	2	3.30 p. m	NE.		2,640 to 3,960	Considerable.
Personville, Tex	2	4 p. m	NE.			
Somerset, Bedford, and Blair Counties, Pa	3–4	Evening	E.			Very destructive.
Big Lick, N. C	6	3.30 p. m	NE.			Considerable.
Eden Center, N. Y	7	1.30 p. m	NE.			
Johnson County, Ark	10	4.30 p. m	NE.	Funnel		
Belle Place, La	10	Evening	E.	...do		
Near Gilmore, Nebr	13	5.25 p. m	NE.	...do		Considerable.
Blue Springs, Nebr	13	4.10 p. m	NE.	...do	200	Very destructive.
Kansas City, Mo	13	10.30 p. m	E.	...do		Did not touch earth.
Near Colony, Kans	16	2 p. m	NE.	...do		
Sun Dance, Wyo	20		NE.	...do	1,320	
Idana, Kans	22	6.45 p. m	NE.	...do		Considerable.
Lisbon, Dak	23	11.30 a. m	SE.	...do		
Altamahaw, N. C	25	3.30 p. m	NE.	...do	2,640	

SUMMARY—Continued.

Place and month.	Date.	Time.	Direction.	Form of cloud.	Width of path.	Total valuation of property destroyed.
May, 1887—Continued.					*Feet.*	
Near Hiattville, Kans	28	2.50 p. m	NE.	Funnel	Narrow	Did not touch earth.
Logansville, Ohio	30	12.45 p. m	NE.			Destructive.
Upper Sandusky, Ohio	30	2 p. m	NE.			Do.
June, 1887.						
Green County, Tenn	1	Afternoon	NE.	Funnel	450	Very destructive.
Carroll and Campbell Counties, Ga.	1	7.10 p. m	E.	...do	300 to 450	Do.
Near Newnan, Ga	1	7 p. m	NE.	...do	100 to 900	Do.
Brunswick, N. C	1	4 p. m	NE.		2,640	
Green district, W. Va	1	7 p. m	NE.		5,280	
Brackettown, N. C	1	Evening	SE.		300	Considerable.
Near Belvidere, N. C	2	9 p. m	NE.	Funnel	300 to 450	Do.
Shawneetown, Ill	3		NE.		Narrow	Light.
Near Lead Hill, Ark	4	4.30 p. m	NE.	Funnel	300 to 1,320	
Blue Creek, W. Va	5		NE.	...do	Narrow	Considerable.
Near Waco, Tex	6	Afternoon			150	Do.
Near Jamestown, Dak	6	5 p. m	NE.	Funnel	Narrow	
Near Huron, Dak	7	3.10 p. m	NE.	...do	...do	
Kansas City, Mo	10	9.30 a. m	NE.	...do		Did not touch earth.
McDowell County, N. C	13		NE.	...do		Considerable.
Grand Forks, Dak	16	3.22 p. m	E.			$150,000.
Maywood, N. C	18	3 p. m	SE.	Funnel	5,280	
Keystone, Minn	18	10 a. m	E.			
Saline, Mo	20	5.15 p. m	NE.	Funnel		$68,000.
Nottoway and Amelia Counties, Va.	21	Evening	NE.			Considerable.
Killeen, Tex	21	10 p. m	S.			Do.
Wilmington, Del	22	12.40 p. m	NE.	Funnel	Narrow	Very destructive.
West Almond, N. Y	24	6.10 a. m	NE.		Narrow	Did not touch earth.

SUBDIVISION OF WEATHER CABLEGRAMS.

In accordance with arrangements perfected by Prof. E. Mascart, director of the Bureau Central Météorologique, Paris, France, the meteorological offices of London and Paris have organized, and with the co-operation of the United States Signal Service, have provided for the transmission of weather dispatches to each of these centers. Upon the receipt of such information bulletins and warnings are issued and telegraphed to all European seaports, by means of which a knowledge of the weather conditions prevailing over that portion of the Atlantic embracing the great storm region north of 35° north latitude becomes available for the benefit of the commerce of two continents.

These cablegrams are of two kinds, one relating to the weather conditions over the entire United States and the other to similar conditions over the Atlantic Ocean, between 35° and 50° north latitude and 45° and 70° west longitude.

The data from which the former is constructed is entered on what is known as the continental code chart, and the data received from shipmasters is charted on what is termed the marine code chart.

The cablegrams are made separately from the two charts, and afterwards combined into one dispatch for convenience and economy, which is cabled to Paris at midnight of each day.

The marine dispatch is based entirely upon observations made by the gratuitous co-operation of shipmasters, who gladly extend every facility in their power toward the successful prosecution of the work, on account of the benefit they receive from the publication of the information.

The land dispatch is made from the 10 p. m. telegraphic reports received from the regular stations of the Signal Service throughout the United States, and charted at the office of the Chief Signal Officer.

There are three kinds of marine meteorological information used in the preparation of cable dispatches, which is collected from shipmasters immediately upon their arrival in the ports of New York, Boston, Philadelphia, and for recording which they have previously been supplied with suitable forms.

(1) Synchronous observations, extending over a period of five days, including date of arrival, which are recorded at 12 m. Greenwich noon, and consist of latitude and longitude, barometer corrected for all error, the direction and force of the wind.

(2) Storms, when not over five days old and observed to the westward of the forty-fifth meridian, giving the date and lowest barometer corrected for all error, together with the change of the wind during its progress.

(3) Gales, or severe storms under the above conditions, but where barometric readings were not obtainable.

In addition to the meteorological information furnished, the position of derelict wrecks, abandoned vessels, icebergs, and floating ice, as reported by incoming vessels as dangerous to navigation, also enter into the composition of the daily cablegrams.

The Signal Service agent at New York City reports that great satisfaction has been manifested by shipmasters on account of receiving from the various meteorological offices information of the existence and location of ice and wrecks, from which they were enabled to shape their westward course with safety.

The duty of preparing and enciphering the Mascart cablegrams is assumed by the indications officer, but the general charge of the correspondence, etc., pertaining thereto and collection of data has been under the charge of Second Lieut. John P. Finley, Signal Corps, assistant.

In the prosecution of this work since its organization, November 17, 1886, 407 forms, No. 171 *b*, containing marine data for cable purposes, have been received from the Signal Service agencies at New York City and Boston.

These forms contained—

(1) Two thousand two hundred and sixty-one daily simultaneous meteorological observations taken west of the forty-fifth meridian at noon, Greenwich mean time, within the limit of time as previously described.

(2) One hundred and fifty-eight special accounts of storms encountered by vessels on their westward passage during the prevalence of which the wind attained a force equal to or greater than 8 on the Beaufort scale, which were also received within the five days limit.

(3) Three hundred and fifty-five different positions in which field-ice or icebergs were observed by incoming vessels.

(4) Seventy-four reports of derelict wrecks or abandoned vessels dangerous to navigation.

The limit in which notice of wrecks, abandoned vessels, icebergs, and similar dangers to navigation may be cabled has been extended so as to include all that portion of the Atlantic Ocean lying between 35° and 50° north latitude, and 70° and 14° west longitude.

REPORT OF JUNIOR PROFESSOR H. A. HAZEN.

Work assigned in general is as follows, and embraces the period from March 1 to June 30, 1887:

(1) Care of all elevations and studies regarding them.

(2) Charge of reduction tables, especially dew-point, and reduction of barometer readings to sea-level.

(3) Charge of computation of tri-daily monthly normals for indications room and means of the same for the Monthly Weather Review.

(4) Reduction of normals for short series of years to what they would be for fifteen years.

(5) Preparation of daily charts for 3 p. m. and 10 p. m.

This work requires entering data on the maps.

(6) Answers to questions put by outside parties.

(7) Preparation from time to time of papers as requested by the Chief Signal Officer.

Work accomplished under these heads:

No. 1. All current work relating to changes of barometers, special reports on elevation of Little Rock, Fort Smith, Baltimore, etc.

No. 2. Dew-point tables have been printed and reports have been made from time to time on reduction to sea-level.

A report on a better method of getting better mean wind direction.

No. 3. Normals for April, May, June, and July, 1887.

No. 4. Preparation of short series of normals for daily rainfall and temperature at about 70 stations.

No. 5. Charts for 3 and 10 p. m. for the interval March 25 to April 10, 1887, prepared. All the data for April entered on charts.

No. 6. Letters prepared on "Probable Rain in Nebraska Coming Summer;" "Greatest Rainfall in a Short Time in New York State;" "Sunspots and Meteorology;" two letters

to "Dr. M. A. Veeder and H. C. Maine;" three letters on "Relation Between Wind Velocity and Pressure."

No. 7. Report on work performed by Professor Waldo; circular regarding temperature and rainfall constant; preparation of Pike's Peak observations for Professor Pickering; paper on "Secular Variation of Rain in Kansas and Texas," for Weather Review; paper on "Upper Currents in the Atmosphere;" report on revision of Guyot's tables; projection of difference of normal temperature from day to day at all stations for the months of January, February, and March; work on anemometer board, and balloon voyage of Professor Hazen from Saint Louis, Mo., to Hoffman, Ill.

I have been ably aided in this work by privates Call and Cobb. I think that much more could be done to good advantage if I had one or two other clerks to read off data to be placed upon maps and to compare work on normals.

This can be done by most any careful person, and it would give more time for other important work. I trust that it may be arranged in such a way that more work may be done, such as Professor Loomis has been doing single-handed and at a great disadvantage from not having the original records either complete or convenient.

This would be in the direct line of the work of the indications room, and would comprise studies in humidity, rainfall, upper currents, origin, development, and progressive movement of low and high areas, etc.

Very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps, Assistant.

The CHIEF SIGNAL OFFICER.

APPENDIX No. 13.

REPORT OF PROPERTY AND DISBURSING DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, July 26, 1887.

SIR: I have the honor to submit the following statement of the work of the property division, for the fiscal year ending June 30, 1887:

PERSONNEL

No changes of importance have occurred in the personnel of the division since last report.

SALES OF PUBLICATIONS.

Two hundred and forty-nine dollars and forty-four cents have been received during the year from sales of maps and bulletins, as allowed by the act of Congress approved March 30, 1874, section 227, Revised Statutes. The amount received was deposited with the Treasurer of the United States to the credit of the appropriation "observation and report of storms."

MUSTERING OFFICER.

Under Instructions No. 7, Signal Office, 1886, Second Lieut. J. C. Walshe, was detailed as mustering officer, and to said officer was assigned the duty of the examination and preparation for settlement of the pay accounts of the enlisted men of the Signal Corps. Lieutenant Walshe was succeeded on August 2, 1886, by Second Lieut. James A. Swift, Signal Corps, who, in turn, was succeeded on December 30, 1886, by Second Lieut. W. D. Wright, who remained in charge at the end of the fiscal year.

The total number of accounts examined and prepared for settlement during the year was 16,600.

OTHER ACCOUNTS SETTLED.

The number of accounts, growing out of the disbursements of the various appropriations expended by this office, settled during the year was 7,002, making an average number per month of 583.

SUSPENSIONS OF ACCOUNTS.

Referring to the statement in my report for the fiscal year ending June 30, 1886, that the accounting officers of the Treasury had not rendered any report of the examination by them of my money accounts, I would say that during the year difference-sheets have been received suspending vouchers aggregating in amount the sum of $118,420.56, of which the sum of $90,168.67 was for disbursements out of the appropriations for the fiscal year ending June 30, 1885. Replies have been made covering all accounts suspended up to date.

PURCHASE OF INSTRUMENTS BY PRIVATE PERSONS.

While the advantages afforded to obtain greater accuracy, by having instruments compared with our standards, for which no charge was made, had induced many private persons, institutions of learning, etc., to purchase instruments through this office, and although this office fully appreciated said advantages, yet for the want of a specific law authorizing the Signal Bureau to transact such business, it was deemed best to discontinue the same. Accordingly, since March 29, 1887, no transactions of the character mentioned have taken place. During the period from July 1, 1886, to March 29, 1887, there have been 126 instruments of various kinds purchased, representing a total cost of $742.60.

As stated in my previous report, these transactions have no connection with the public funds disbursed by me; this office simply acts as a medium of communication between the manufacturers of the respective instruments and the persons desiring to purchase them.

INSTRUMENTS PURCHASED FOR OFFICIAL USE AND ISSUED.

Eleven hundred instruments of various kinds have been purchased during the year for the use of this service, and 3,105 instruments have been issued since last report.

AVERAGE COST OF MAINTAINING STATIONS OF OBSERVATION.

The average cost of maintaining each station of observation during the year (exclusive of the cost of telegraph service and the pay and allowances of the enlisted force on duty at each) has been $248.50. The station costing the least was Cairo, Ill., $2.50 only being expended thereat during the year; the station costing the most was Chicago, Ill., at which the sum of $1,253.27 was spent during the year.

CORRESPONDENCE.

The total number of letters received during the year was 47,324, containing 67,625 inclosures.*

The total number of letters sent was 38,250, which included 3,752 indorsements.

SHIPMENTS.

In the packing and shipping room there were 13,997 distinct shipments made, through the Quartermaster's Department, by mail, and by express.

PACKAGES RECEIVED.

There were received during the year 3,930 packages.

MACHINE SHOP.

The usual quantity of work has been done in the machine shop, in the manufacture and repair of instruments and repairs about the office.

CARPENTER SHOP.

In the carpenter shop all the boxes for shipment of supplies are made and jobbing and repairs about the office are done, and the two men employed therein have been kept busy during the year at such work.

LIBRARY

The library has received during the year, by purchase, exchange, or gift, 567 volumes, and now contains 11,106 volumes, of which number, however, 1,261 books and 755 pamphlets were transferred, by authority of the honorable the Secretary of War, to the War Department library, leaving the net number of volumes in Signal Office library on June 30, 1887—9,845. The pamphlets, although catalogued, have never been numbered as books.

APPROPRIATIONS.

The condition of the appropriations (disbursed by this office) for the fiscal year ending June 30, 1887, with expenditures thereunder, and balances, with probable demands on such balances, as required to be rendered by the act of Congress, approved May 1, 1820, is as follows:

Appropriated:	
Observation and report of storms	$264,350.00
Maintenance and repair of military telegraph lines	24,000.00
Signal Service, U. S. Army	3,000.00
Expended:	
Observation and report of storms	$182,170.12
Maintenance and repair of military telegraph lines	19,783.16
Signal Service, U. S. Army	1,945.83

*Included in total for whole office in statement by correspondence division. M. 27 to 29.

Balances:	
Observation and report of storms	$82,179.88
Maintenance and repair of military telegraph lines	4,216.84
Signal Service, U. S. Army	1,054.17
Probable demands:	
Observation and report of storms	73,141.11
Maintenance and repair of military telegraph lines	4,216.84
Signal Service, U. S. Army	1,054.17

Statement of amounts appropriated under the different heads for the support of the Signal Service, U. S. Army, for the fiscal year ending June 30, 1887.

Legislative, executive, and judicial:	
Regular clerks and messengers	$10,660.00
Scientific experts, clerks, etc	30,000.00
Postage stamps (allotted by Secretary of War)	890.79
Stationery (allotted by Secretary of War)	3,973.32
Rent of buildings for Signal Office	7,500.00
Contingent expenses (allotted by Secretary of War)	7,231.75
Total	60,255.86
Sundry civil expenses—observation and report of storms:	
Manufacture, purchase, etc., of instruments	10,000.00
Telegraphing reports	120,000.00
Expenses, storm signals	10,000.00
Cotton-region reports	7,000.00
Stations connected with life-saving stations	26,350.00
Instrument shelters	2,000.00
Rents, etc., of offices outside of Washington	35,000.00
River and flood reports	9,000.00
Maps and bulletins	25,000.00
Capes Charles-Henry cable	20,000.00
Total	264,350.00
Maintenance and repair of military telegraph lines	24,000.00
Pay, etc., of the Signal Corps:	
Pay of officers	34,180.00
Pay of enlisted men	181,711.50
Mileage for officers	4,000.00
Commutation of quarters	5,500.00
Total	225,391.50
Subsistence Department:	
Subsistence and commutation of rations, Signal Corps	149,269.38
Quartermaster's Department:	
Regular supplies:	
Fuel	6,000.00
Commutation of fuel	45,000.00
Forage for public animals	1,805.65
Forage for private animals	1,365.00
Straw for public animals	112.00
Straw for private animals	109.20
Total	54,391.85

Incidental expenses:	
Shoeing public animals	$288.00
Shoeing private animals	234.00
Veterinary supplies	50.00
Blacksmiths' supplies	100.00
Total	672.00
Interment of officers and men	100.00
Transportation:	
Material and funds	15,000.00
Men	6,000.00
Repairs to means of, etc	300.00
Total	21,300.00
Barracks and quarters	84,009.17
Medical Department:	
Medical attendance and medicines to officers and men	2,000.00
Total	2,000.00
Printing and binding (allotted by Secretary of War)	15,151.50
Support of the Army:	
Expenses Signal Service, U. S. Army	3,000.00
Total	3,000.00
Grand total	903,891.26

CLERICAL FORCE.

On July 1, 1886, there were employed in this division 69 men—44 enlisted men and 25 civilians.

On June 30, 1887, there were employed in this division 75 men—47 enlisted men and 28 civilians—the 75 men being distributed as follows: Clerks, 29 enlisted men and 3 civilians; mechanics, messengers, and laborers, 18 enlisted men and 25 civilians.

SEA-COAST TELEGRAPH.

Offices in operation and reporting direct to the Chief Signal Officer July 1, 1886	18
Offices opened (Cape Charles City, Va.) February 10	1
Offices transferred (to Lieutenant Weber) August 31, 1887, Cottage City, Nantucket, Wood's Holl, Edgartown, Mass	4
Offices closed December 8, 1887, Fort Macon, New River, N. C	2
Offices in operation June 30	13

Receipts:	
July, 1886	$350.45
August, 1886	524.47
September, 1886	837.36
October, 1886	40.85
November, 1886	44.20
December, 1886	96.19
January, 1887	
February, 1887	58.97
March, 1887	96.50
April, 1887	85.23
May, 1887	63.47
June, 1887	44.90
Total deposited to credit United States Treasurer	$2,242.59

MILITARY TELEGRAPH.

Offices in operation and reporting direct to the Chief Signal Officer on July 1, 1886	41
Offices opened (Bly, Oregon) January 30, 1887	1
Offices taken up by transfer April 30, 1887, Fort Davis, Brownsville, Marfa, Rio Grande, Tex	4
Offices closed Sept. 30, 1886, Fort Shaw, Helena, Fort Assinaboine, Fort Benton, Mont.; December 8, 1886, Fort Canby, Wash.; March 19, 1887, Neah Bay, Pysht, Wash.; March 30, 1887, Port Angeles, Tatoosh Island, Wash.; June 16, 1887, Fort Cœur d'Alene, Wash	10
Remaining in operation June 30, 1887	36

Receipts:

July, 1886	$849.85
August, 1886	738.45
September, 1886	728.62
October, 1886	626.29
November, 1886	566.80
December, 1886	431.18
January, 1887	29.00
February, 1887	261.22
March, 1887	275.70
April, 1887	307.32
May, 1887	581.04
June, 1887	432.49
Total deposited to credit United States Treasurer	5,827.96

The value of free business, if paid for, would have aggregated the sum of $3,685.54.

The system of rendering the accounts-current telegraph line receipts of the property and disbursing officer, was changed on January 1, 1887. (G. O. 58, 1886).

By the new system, only the funds actually received during any one month by the property and disbursing officer, are taken up on the account-current for that month, and all moneys received on account of line receipts during any one month are taken up on the proper account (this line or other line) for said month, and credited to the stations from which received, but without regard to the month during which the moneys may have been received at said stations. Each remittance is required to be accompanied by invoices and receipts in duplicate. The invoices are used (instead of the station accounts-current, as formerly) as vouchers to the property and disbursing officer's account-current; one copy returned to the operator in charge, and one copy retained in this office to be filed with the proper station account-current, as a voucher thereto.

The property and disbursing officer's accounts-current are forwarded within ten days after the close of each month, instead of holding them for the station accounts to be adjusted and other line bills to be settled, as was the case under the old system.

PROPERTY RESPONSIBILITY.

During the year an effort was made to transfer to the enlisted men of the Signal Corps the absolute responsibility for all public property at the stations at which said men might be serving, and thus relieve the property and disbursing officer of carrying on his returns vast quantities of property, most of which he had never seen. The plan submitted was in analogy to that in force in the Ordnance Department. The matter was submitted to the honorable the Secretary of War, who referred it to the Judge-Advocate-General for an opinion, and that officer, while fully realizing the fact that the disbursing officer of this service should be relieved, yet felt constrained to decide against the plan, for the reason that Congress alone by special legislation could transfer the responsibility for public property to an enlisted man.

CONTRACTS.

As required by the act of Congress approved April 21, 1808 (Statutes at Large, vol. 2, p. 435), I submit herewith list of contracts made by me during the fiscal year ending June 30, 1887:

With whom made.	For what purpose.
Hutchinson, Williams & Co.	Furnishing forage.
T. J. Southerland	Do.
Edward Drinkwater	Do.
John C. Waterfield	Do.
W. H. Purnell	Do.
Chadwick & Jones	Do.
A. J. Stowe	Do.
C. H. Toler	Do.
E. W. Ward	Do.
Hutchinson, Williams & Co.	Care and stabling public animal.
W. H. Purnell	Do.
D. M. Etheridge	Do.
L. H. Rodgers	Manifold forms.
D. Quinlivan	Shoeing mule.
Julius Jensen	Furnishing fuel.
Border City Ice and Coal Company.	Do.
George S. Hookey	Furnishing fuel.
Powell Bros	Do.
J. W. Evans	Do.
E. M. Toucey	Do.
John C. L'Engle	Do.
H. C. Sinton	Do.
John Schneider	Shoeing public animal.
J. C. Tucker, jr	Furnishing fuel.
Fowler & Morrison	Do.
Diggs Bros	Do.
Adams Bros. & Paynes	Do.
N. J. Dodson & Co	Do.
Gustavus A. Morrill	Do.
Batchelder & Collins	Do.
J. T. Harper	Do.
John Gandolfo	Do.
P. J. McDonald	Do.
Bismarck Coal and Wood Company.	Do.
Robert Henderson	Do.
George W. Jenkinson	Do.
Paine Bros	Do.
Elijah Sibbern	Do.
A. Rhoads & Bro	Do.
G. I. Taggart	Do.
Union Coal and Mining Company.	Do.
E. B. Mastick, jr	Do.
Fred. A. Schmidt	Draughting material.
E. E. Rider	Do.
Geo. Ryneal, jr	Do.
Callahan & Gartland	Do.
Jas. J. Chapman	Do.
F. B. Lathrop	Furnishing fuel.
Jas. W. Queen & Co.	Maximum thermometers.
Do	Minimum thermometers.
Do	Water thermometers.
Do	Whirling apparatus.
Forsberg & Murphy	Wind vanes.
Cornelius Murphy	Packing provisions
Do	Furnishing fuel.
Wm. Johnson & Co.	Do.
T. A. Silsby	Do.
A. V. Allen	Do.
L. W. Moore	Do.
S. Hamilton	Do.
Arthur M. Ebbetts	Do.
P. W. Cunningham	Do.
E. W. Reed	Do.
P. O. Harris	Do.
C. G. Abercrombie	Do.
Horn Silver Mining Company.	Do.
Nebraska Fuel Company.	Do.
Bangs & Horton	Do.
Anthony & Bryce	Do.
D. J. Whealton & Co	Furnishing fuel.
H. W. Stocking	Do.
N. M. Bedford & Co	Do.
W. & A. McArthur	Do.
Nottingham & Wrenn	Do.
David Wood	Do.
J. P. Friez	Anemometer supports.
J. L. Kervand	Engraving chart.
T. J. Southerland	Care and stabling animals.
J. E. Callahan	Furnishing fuel.
F. B. Spear	Do.
Coal department Union Pacific Railway Company.	Do.
J. Connolly	Do.
Jesus Sedillo	Do.
C. M. Bassett	Do.
El Paso Coal and Lime Company.	Do.
S. W. Bear	Do.
E. E. Rider	Carbon paper and Shipman's files.
J. J. Chapman	Do.
Samuel Hano & Co	Do.
W. A. Wheeler, jr	Stationery supplies.
Thomas G. Hood	Do.
Detre & Blackburn	Do.
E. E. Rider	Do.
Easton & Rupp	Do.
Bulkley, Raiguel & Co	Do.
Ballantyne & Son	Do.
Nescochague Manf'g Co	Do.
W. J. C. Dulaney & Co.	Do.
Samuel I. Knight	Do.
S. T. Smith	Do.
J. R. Michael	Do.
J. J. Chapman	Do.
George Meier & Co	Do.
Poole & Brooke	Printing and lithographic supplies.
H. L. Pelouze & Son	Do.
Fuchs & Lang	Do.
J. C. Entwistle	Do.
William Gay	Do.
W. H. Walmsley & Co	Mercurial thermometers.
L. Reed, jr., & Co	Furnishing fuel.
Daniel Wheeler & Co	Do.
A. G. Sinclair	Do.
Lamb Bros	Do.
Western Electric Company.	Submarine telegraph cable.
Walter B. Dean	Furnishing fuel.
F. P. May & Co	Hardware.
E. G. Wheeler	Do.
F. A. Schneider	Do.
E. S. Ritchie & Son	Anemometers.
Raphael Romero	Furnishing fuel.
McCormick & Flatly	Do.
William Lohmiller	Do.
E. S. Greeley & Co	Submarine telegraph cable.
William Gisriel	Telegraph supplies.
India Rubber Comb Company.	Do.
F. A. Schneider	Do.
J. F. Morrison	Do.
National Electric Company.	Do.
J. B. Jones	Furnishing fuel.
W. J. Wallace	Do.
Hunt Brothers	Do.
M. A. Murphy	Do.
James W. Queen & Co	Paints, acids, etc.
Eimer & Amend	Do.
Charles Cooper & Co	Do.
Daniel Shanahan	Do.

With whom made.	For what purpose.	With whom made.	For what purpose.
F. A. Schneider	Paints, acids, etc.	Thomas C. Boland	Furnishing fuel.
W. H. Butler	Do.	Walter S. Osborn	Do.
W. D. Lent	Do.	S. T. Aydelott	Do.
Francis Miller	Do.	J. C. Entwistle	Engraving chart.
M. Smith & Co	Furnishing fuel.	Crane & Co	Telegraph poles.
Jackson & Co	Do.	Parsons & Hale	Furnishing fuel.
Earnest Jarvis	Do.	Thomas Lafferty	Do.
Thomas Poynter	Do.	R. N. Scruggs & Co	Do.
E. W. Perry & Co	Do.	J. T. Dodge	Do.
C. C. Crosby	Do.	Bacon & Carr	Do.
Frank H. Chappell	Do.	E. S. Greeley & Co	Furnishing wire.
Walter Frey	Do.	Peter Sonna	Furnishing fuel.
Hensen & Linehan	Do.	Arthur M. Ebbetts	Do.
J. H. Kerkland	Do.	E. D. Sidbury	Do.
Jerry Millay	Do.	H. J. Green	Barometers
Simon Stuckey	Do.	E. C. Sanborn	Furnishing fuel.
Z. G. Burrus	Do.	J. T. Harper	Furnishing forage.
Fowle & Brownlee	Do.	Gus. Heine	Furnishing fuel.

OFFICE AND STORAGE ACCOMMODATIONS.

As in the past three years, so now, I again invite attention to the inadequate office and storage accommodations; several estimates have been made for appropriations for the purchase of various sites and erecting thereon the necessary buildings, but from some cause or another Congress has thus far failed to do anything. It is true that at the last sessoin a bill was reported favorably for the purchase of a building, etc., but owing to the agitation of the transfer of the Weather Bureau to another Department, final action was not had. The needs are the same now as then, and the matter should be definitely settled.

STATUS OF WORK.

The work of the entire division is well up to date.

CONCLUSION.

I take pleasure in stating that the efficient services of Mr. Wm. R. Bushby, chief clerk of the property division, have, in my opinion, been of great benefit to this bureau in keeping the work up, having it performed correctly, and arranging for the purchasing of supplies.

With but few exceptions the men on duty in this division have well and faithfully performed the duties assigned them.

I am, very respectfully, your obedient servant,

F. B. JONES,
Captain and A. Q. M., U. S. A.,
P. and D. Officer, Signal Service.

The CHIEF SIGNAL OFFICER.

APPENDIX No. 14.

REPORT OF OFFICER IN CHARGE OF PUBLICATIONS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, July 1, 1887.

SIR: I have the honor to submit the following report relative to the publications division for the fiscal year ending June 30, 1887.

The work of the division naturally divides itself into three classes, draughting, printing, and distribution, each of which has been assigned to an appropriate subdivision, whose employés are specially fitted to perform their respective duties. The following synopsis of the work performed in the respective subdivisions is respectfully submitted.

The aggregate amount of work required of the division during the year has approximately remained the same as at my last report, a decrease in the amount of letter-press printing done being compensated for by an increased amount of lithograph work.

DRAUGHTING ROOMS.

During the year the employés herein have accomplished the following:

International meteorological charts completed	365
International monthly mean charts completed	12
Charts redrawn for the Monthly Weather Review	48
Miscellaneous meteorological charts, monthly, seasonal, and annual, completed	51
Mechanical drawings completed	367
Tracings of drawings made	481
Charts and mechanical drawings transfered to stone	335
International charts prepared for transfer	300
Maps mounted	155
Charts reduced by pantograph	30
Helio prints made	15

In addition to the above, group charts of all the international monthly mean tracks of low barometric pressure for January and February from 1878 to 1886 were completed. The chief draughtsman has also inspected and passed 258,530 printed charts. The draughtsman prepared only a part, but entered all the meteorological data upon the international charts reported completed.

PRINTING ROOM.

The following tabular statement will show the amount of work performed herein:

Special bulletins	9,310
General orders	44,205
Special orders	15,880
Instructions	10,955
Circulars	14,550
Monthly Weather Review	34,425
Monthly Summary	6,500
Wrappers	128,500
Letter-heads	132,800
Letters	28,910
Envelopes	643,400
Forms	572,452
Miscellaneous	102,305

The letter-press work of this subdivision shows a slight decrease in apparent amount performed from last year. The same high standard of execution noticeable in previous years has been maintained, and perhaps has advanced. The typography of this office will in

every way compare favorably with that of any office, public or private, in this city. The decrease in work done is in part only apparent, as both the periodical publications of the office, the Monthly Weather Review and the Monthly Summary of International Meteorological Observations, have been increased in size and in demands upon the mechanical ingenuity of the printers for their creditable construction. The former publication especially has been considerably enlarged in letter-press and in lithographic work, and its contents have been arranged in a more systematic manner. The demands upon the lithographic portion of this subdivision are constantly increasing, and the present facilities are greatly inferior to our needs. The work done, while highly creditable in itself, is especially so in view of the difficulties the lithographers have to encounter with the materials for their labor. The improved press facilities promised for the ensuing year will enable the work to be performed with greater rapidity than heretofore. Much better work can hardly be expected. The main increase in lithographic work was the addition to the maps published by this office, of those for the 3 p. m. and 10 p. m. observations, the publication of which began January 1, 1887, making, with the 7 a. m. map, whose publication has long been a feature of this office, a series of tri-daily maps.

The following statement shows the amount and character of the work in the lithograph room:

Base maps	394,037
Morning (7 a. m.) maps	123,139
Review maps	184,662
Tri-daily maps	68,338
Summary maps	17,662

DISTRIBUTING ROOMS.

The work of this subdivision has increased within the past year. Applications for the publications of the service have been steadily increasing in number and it is necessary to devote considerable time and labor to their consideration, and much discrimination therein is demanded to insure a profitable distribution of the publications of the service. The division in general is believed to be in much better condition than at my last report. Without entering specially into details I may state that modes of operation have been adopted which are better suited to the work to be done and which have materially lessened the labor. Though the work of this subdivision has increased somewhat, there has been a decrease in the force engaged upon it. A great hindrance to the working of the division has always existed in the fact that its employés and rooms have been so widely separated and scattered. The headquarters and distributing rooms are 1718 Pennsylvania avenue, the printing and lithograph rooms across the street, at 1719 Pennsylvania avenue, while the force of draughtsmen have been divided between 1725 G street and 618 Seventeenth street. The extent to which this separation has proved a drawback to the effective and prompt working of the division can hardly be estimated,

The contemplated removal of almost the entire division to compact and convenient rooms in 1744 G street promises improvement in these respects. The total number of employés in the division at the close of the year is 28, consisting of 24 enlisted men and 4 civilians, classed as follows:

Clerks	3
Draughtsman in charge	1
Draughtsmen	4
Printer in charge	1
Printers	9
Lithographers	4
Proof-reader	1
Pressman	1
Press-boy	1
Stitchers and folders	2
Engineer	1

R. B. WATKINS,
Second Lieutenant, Signal Corps, in charge.

The CHIEF SIGNAL OFFICER.

APPENDIX No. 15.

DETAILED STATEMENT OF WORK PERFORMED BY PROF. CLEVELAND ABBE AND ASSISTANTS.

SIGNAL OFFICE, *July* 29, 1887.

SIR: I have the honor to make the following report of work accomplished by myself and assistants during the year ending June 30, 1887.

In conformity with instructions No. 39, August 2, 1886, the assistants assigned me during the year have been Junior Prof. Frank Waldo, Bibliographer C. J. Sawyer, Sergeant G. E. Curtis, and Private E. H. Hilton.

The general work of the room has been the preparation and completion of the bibliography of meteorology, which was especially intrusted to Mr. Sawyer as bibliographer, with Private Hilton as assistant, and the completion of my treatise on meteorological instruments, in which Sergeant Curtis and Professor Waldo have assisted me. Besides these, miscellaneous reports and work has been necessary, as called for from time to time, of which the following is an enumeration:

WORK AS A MEMBER OF BOARDS.

Board of instruction: Two meetings.

Board of publications: Five meetings and detailed examinations of papers submitted by Lieutenants Finley and Powell, Professor Waldo, Private Pague, and Sergeant McAdie.

Board of professors: Four meetings.

Board on verifications of Lieutenant Glassford's predictions: Work completed July 24, 1886.

Board on the transfer of library books to the War Department: About one month s work by Mr. Sawyer.

Examination of international bulletin maps: The month of June, 1885, examined in July, 1886.

MISCELLANEOUS REPORTS.

July 16, 1886: On local weather predictions.

July 9: On the proposed discontinuance of 11 a. m. and 7 p. m. observations.

August 13: On comparative rainfall observations and the exposure of the rain-gauge.

August 13: On the exposure of the barometer.

August 15: On the exposure of the anemometer.

August 18: On the solar radiation thermometer.

August 15: On the storms of November and December, 1885.

September 9: On work recommended for the year 1887–'88.

October 12: On a table of wind pressures.

November 20: Astronomical computations by Sergeant Curtis, reducing observations made by the Lady Franklin Bay Expedition.

January 4, 1887: On the verification of cautionary signals.

February 14: On the Signal Service psychrometer tables.

February 19: On books recommended for the study of meteorology.

February 21: On the reduction of the barometer to sea level.

April —: Statistics of amount of work during past three years.

Junior Professor Waldo assisted me in the preparation of the treatise on instruments during the last three months of the year, after having completed the work assigned him during the previous fiscal year, which work consists of the following:

A memoir on international comparisons of normal barometers.

A report on anemometer observations at sea.

Notes on European weather services.

Translation of Poisson on the deflections caused by the earth's rotation.

Translation of Schoch on the distribution of temperature on the earth's surface.

Collection of memoirs relative to dynamic meteorology.

In the work on the bibliography of meteorology Mr. Sawyer has classified by subjects about 38,000 cards, thereby completing the total of 53,000 titles. The classification includes 169 subdivisions. There has also been prepared an author index, which includes about 12,400 names of authors. The number of new titles added to our collection during the year has been 1,134. The tota number of living authors who have contributed to the perfecting of this work is 165. The practical value of the bibliography has been shown by the references made to it daily in the work of this office, and by the very ex-

tensive assistance it has enabled Mr. Sawyer to give to others. Over a month of Mr. Sawyer's time has been consumed in preparing bibliographical data for replies to official inquiries. It is evident that when printed the catalogue will be used by every active student of meteorology, and that only by printing can we provide against its destruction by fire or accident and make a suitable return to those who have assisted in its compilation. Additional details of this work are given in Mr. Sawyer's report appended hereto.

The treatise on meteorological instruments, as reported by me on June 30, embraced about 750 pages of manuscript, and covered the subjects of units, thermometry, barometry, anemometry, and pluviometry. Other chapters will be added, if possible. This work is designed to give considerable detail as to every known source of error in methods and instruments, and to present the best knowledge now attainable bearing on such points as are not yet well established. But little of the information herein given is to be found in text-books. The whole work is an elaboration of lectures that I have given during the past five years to classes under instruction, and will be useful to all who desire increased accuracy in the results of observations.

It would be improper for me to close this report without expressing my high appreciation of the ability and faithfulness of all of my above-mentioned assistants.

I remain, very respectfully, yours,

CLEVELAND ABBE,
Professor and Assistant.

The CHIEF SIGNAL OFFICER.

SIGNAL OFFICE, *Washington City, July* 15, 1887.

SIR: I have the honor to submit the following report of work done on the meteorological bibliography during the year ending June 30, 1887.

On July 1, 1886, the bibliography consisted of an author card-catalogue of about 52,000 titles, for 15,000 of which a classification by subjects and an author index had been made. The work of the past year has consisted chiefly of classification by subjects, preparation of an author index, the revision of the material on hand, and the collection of new titles.

The classification by subjects has been completed, and is indicated on the cards; but the latter are not yet arranged under their assigned subjects. In accordance with the plan outlined in my report for 1885, this classification is to a certain extent preliminary; the lower subdivisions are necessarily experimental, and their final determination depends upon the number and character of the titles found under each subject.

The arrangement by subjects will be begun at once, and the classification carefully examined and revised; some minor modifications will probably be necessary, but the scheme, as a whole, has proven very satisfactory. The one-hundred and sixty-nine subdivisions thus far employed are sufficient to render much further subdivision unnecessary, except under the head of observations, which yet have to be arranged geographically.

The method of classification noted in my last annual report has been continued, titles being classified from the original works when possible, and all the resources of the libraries of this city have been drawn upon for this purpose. In addition, constant correspondence has been maintained for the explanation of doubtful titles, and the office is indebted to many meteorologists of this and other countries for much valuable information, especially in regard to the publications of the various meteorological services and observatories, the early series of which can seldom be determined without aid from the present official staffs.

The author index, now completed, contains about 12,400 authors' names, and is in its final form, no revision being necessary, except as modifications are made in the subject catalogue.

In connection with the work of classification, a thorough examination and revision of titles has been maintained, resulting, as expected, in the detection of many duplicates, and the frequent correction of the titles originally received.

I have continued my endeavors to secure the completeness of the bibliography, by constant search for volumes or sets of serials not yet indexed, and by the examination of the collected works of authors, catalogues of libraries, and special bibliographies. In response to lithographed letters requesting lists of publications, these have been furnished by eighteen authors, making a total of one hundred and sixty-five persons who have thus co-operated in this work.

The number of volumes examined and new titles obtained is as follows:

	Volumes.	Titles.
Periodicals	958	951
Catalogues, bibliographies, etc	14	183
Total	612	1,1[illegible]

The value of this work can not be gauged by the number of new titles gained, but consists largely in the constant check thus afforded on the accuracy and fullness of the titles on hand, and in the assurance of the completeness of the bibliography for certain sources, thus restricting to narrow limits the future work on this subject.

The work remaining consists of the arrangement of the cards by subjects, revision of the classification, geographical subdivision of the observations, and the preparation of an alphabetical subject-index and a list of periodicals. This will occupy the present force of two persons for about five months; there will then remain the determination of questions of type, style, etc., and the technical preparation for the printer, which steps should be delayed till provision is actually made for publication.

The practical value of the bibliography has been fully shown during the past year by its constant use in current office work. No attempt has been made to record the almost daily calls for information, but I cite the following as among the more important work of this nature:

On September 20, 1886, there were furnished, at the request of Mr. F. B. Perkins, librarian of the San Francisco public library, suggestions relative to the proposed meteorological section of the great Sutro scientific library, and a list of one hundred and one works of special value in its formation.

In March, 1887, I suggested, for the information of members of the Signal Service who may wish to pursue a course of reading in meteorology, a classified list of forty-one works as among the most valuable for this purpose. This was issued as an office circular on March 11.

On May 2, 1887, by order of the Chief Signal Officer, I submitted for publication, as an appendix to his report on the Lady Franklin Bay Expedition, a list of three hundred and forty-six titles of the principal authorities on Arctic meteorology found in the libraries of this city.

Calls for the complete literature of a subject have been frequent, but it has been necessary to request delay until the catalogue should be arranged by subjects, when such calls will be answered fully.

Consultation of the bibliography at present is possible only by a knowledge of the names of authors contributing to the subject under discussion, but the subject arrangement will make available for office use a very complete classified catalogue, each special subject by itself, so that its examination will be but the work of running over the titles under it.

The net result of the work is a collection of special bibliographies, each worker having at his command a complete index of what has been accomplished in his line. The duplication of work avoided and the time saved in tracing a subject can not be estimated; on this point, I submit the following quotation from the presidential address of Prof. G. J. Symons to the Royal Meteorological Society, January 18, 1882:

"Another obstacle to meteorological progress and a great cause of wasted labor has been the difficulty of ascertaining what has been done in, and what has been written upon, each of the various branches of meteorology. I could give details of many experiments and investigations tried over and over again, each new investigator fancying that it had never been tried before. This is one of the leading arguments in behalf of meteorological bibliography."

In regard to publication, I can only renew my recommendation that an earnest effort be made to secure an appropriation at the next session of Congress. A printed catalogue is necessary for office use, since reference to a manuscript catalogue at best is slow and laborious. The importance attached to this work by scientists is shown by the large number of American and foreign meteorologists and librarians who have aided in its compilation. Over one-half of the material has been contributed from abroad, and the bibliography now represents many years of labor additional to that performed at this office. The material can never be duplicated, and its use should not be restricted to ourselves, but provision be made for its general distribution.

It is not only for this office, and in fulfillment of our obligations to those by whose aid this work has been made possible, that a published catalogue is necessary, but the bibliography will be of great practical value to the agricultural, commercial, engineering, and medical interests of this country and the world, by opening up to all students the literature of applied meteorology in its relations to crops, forestry, river and ocean navigation, hydrology, protection against floods and storms, medical climatology, epidemic diseases, and many other subjects of universal importance.

In closing, I desire to call attention to the continued excellence of the work of my assistant, Private H. E. Hilton. He has now been with me three years, and his work, requiring special qualifications and training, merits recognition from the office. I respectfully recommend his promotion.

I am, very respectfully, your obedient servant,

C. J. SAWYER,
Bibliographer.

Prof. CLEVELAND ABBE,
Assistant.

Monthly and yearly meteorological summaries—Continued.

ATLANTA, GA.

[Latitude, 33° 45′ N.; longitude, 84° 25′ W.]

Month and year.	Pressure.			Temperature.						Mean.		Dew-point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	28.869	29.43	28.27	32.1	40.9	35.4	36.1	60	-2	44.2	28.2	27	29	29	28	80	64	78	74	7.33	2.98
F ..	28.949	29.42	28.61	36.0	48.5	41.3	41.9	65	8	51.6	32.4	27	26	27	27	70	46	58	58	1.53	0.67
M .	28.849	29.13	28.36	44.1	56.7	49.6	50.1	73	27	59.2	42.6	36	36	37	37	75	51	65	64	11.16	7.36
A ..	28.894	29.16	28.48	53.6	67.8	59.7	60.4	82	32	70.0	51.8	47	47	47	47	79	50	66	65	2.52	1.04
M .	28.852	29.07	28.55	61.1	75.9	67.2	68.1	90	44	78.4	58.7	55	55	56	55	80	50	68	66	6.21	3.19
J ..	28.837	29.61	28.58	68.2	78.2	70.6	72.3	90	60	80.8	66.3	65	65	65	65	89	66	84	80	8.68	1.92
J ..	28.830	29.02	28.66	69.6	83.6	74.2	75.8	92	58	85.6	67.8	67	66	68	67	90	57	82	76	2.08	1.13
A ..	28.863	29.07	28.57	70.1	83.4	74.7	76.1	94	62	85.7	68.8	67	68	69	68	91	62	83	79	2.36	0.62
S ..	28.973	29.15	28.76	66.5	81.0	71.2	72.9	90	53	82.8	64.9	63	64	64	64	88	58	79	75	0.53	0.34
O ..	29.026	29.24	28.75	53.5	71.9	61.5	62.3	84	34	73.2	52.1	47	48	48	47	78	44	62	61	0.03	0.03
N ..	28.961	29.21	28.57	44.2	58.4	49.2	50.6	75	28	60.2	41.1	35	36	37	36	72	49	66	62	5.32	1.75
D ..	28.957	29.17	28.52	36.3	46.3	39.5	40.7	65	15	48.2	32.6	32	33	33	33	84	63	79	75	3.03	1.15
Y ..	28.905	29.43	28.27	52.9	66.0	57.8	58.9	94	-2	68.3	50.6	47	48	48	48	81	55	72	70	50.78	.....

ATLANTIC CITY, N. J.

[Latitude, 39° 22′ N.; longitude, 74° 25′ W.]

J ..	30.041	30.81	28.80	26.6	33.3	29.3	29.7	53	2	37.7	21.9	22	28	25	25	83	80	86	83	3.17	0.97
F ..	30.070	30.50	29.27	26.8	33.6	29.3	29.9	50	-2	37.9	22.3	22	26	24	24	82	75	80	79	4.92	2.17
M .	29.931	30.45	29.26	35.3	42.8	36.3	38.1	67	11	45.5	30.8	30	32	31	31	82	70	81	78	3.40	0.83
A ..	30.100	30.53	29.40	47.0	50.9	46.0	48.0	83	28	54.8	41.0	42	42	42	42	84	75	87	82	1.86	1.45
M .	29.922	30.36	29.51	54.4	59.6	54.0	56.0	75	40	62.2	49.5	50	50	50	50	85	74	88	82	4.15	1.11
J ..	29.977	30.32	29.51	64.4	69.0	63.8	65.7	82	50	71.9	58.8	60	60	60	60	86	75	88	83	2.56	1.07
J ..	29.945	30.26	29.73	70.4	75.7	70.3	72.1	86	58	78.4	65.9	67	68	67	67	88	78	91	86	4.73	1.64
A ..	29.977	30.34	29.60	69.5	75.3	69.5	71.4	86	55	77.6	65.1	65	67	66	66	87	76	90	84	3.58	2.48
S ..	30.127	30.41	29.75	66.2	72.4	66.8	68.5	86	50	75.4	62.8	62	62	63	62	86	72	87	82	0.89	0.69
O ..	30.161	30.51	29.81	54.4	62.8	57.1	58.1	74	36	65.5	51.0	51	53	53	52	88	72	86	82	8.16	6.02
N ..	30.032	30.46	29.50	43.7	51.6	44.7	46.7	65	24	55.0	38.5	39	41	40	40	84	68	82	78	3.45	1.42
D ..	30.115	30.56	29.51	30.2	36.9	32.4	33.2	51	14	40.6	26.1	27	31	29	29	89	79	88	85	3.93	0.86
Y ..	30.033	30.81	28.80	49.1	55.3	50.0	51.5	86	-2	58.5	44.5	45	47	46	46	85	75	86	82	44.80	.....

AUGUSTA, GA.

[Latitude, 33° 28′ N.; longitude, 81° 54′ W.]

J ..	29.904	30.55	29.22	34.2	47.4	39.1	40.2	68	6	51.0	30.5	31	33	33	32	89	61	80	76	3.69	0.98
F ..	29.975	30.52	29.59	36.5	55.3	42.2	44.7	71	13	57.9	33.6	31	31	34	32	82	43	73	66	1.70	0.59
M .	29.857	30.18	29.40	46.7	62.9	52.9	54.2	82	26	65.4	43.9	42	40	43	41	84	46	70	67	7.42	4.84
A ..	29.895	30.19	29.46	55.6	73.3	60.3	63.1	89	34	75.5	52.3	50	47	51	49	83	42	73	66	1.86	0.85
M .	29.818	30.06	29.44	65.6	82.9	68.0	72.2	97	47	85.3	60.8	58	55	60	58	78	41	76	65	6.29	3.64
J ..	29.813	29.97	29.58	71.4	82.9	72.0	75.4	94	62	86.6	67.9	68	67	68	68	88	62	88	80	9.65	2.01
J ..	29.788	29.97	29.54	72.4	87.2	74.1	77.9	97	63	90.4	69.5	70	69	71	70	92	57	91	80	7.51	2.26
A ..	29.819	30.02	29.53	72.4	86.3	74.1	77.6	101	61	89.5	69.4	70	69	70	70	92	58	89	80	2.29	1.37
S ..	29.913	30.14	29.71	68.8	83.7	71.6	74.7	95	60	87.0	66.8	66	69	69	68	92	62	91	82	0.65	0.64
O ..	30.010	30.23	29.77	51.7	75.1	58.3	61.7	86	34	77.3	50.1	50	61	56	56	94	62	91	82	0.14	0.07
N ..	29.969	30.23	29.56	42.5	64.3	48.8	51.9	79	26	67.8	39.7	41	52	47	47	94	65	93	84	1.29	0.45
D ..	29.980	30.26	29.44	36.1	51.6	40.1	42.6	67	20	55.2	33.3	34	42	38	38	93	74	94	87	3.55	1.12
Y ..	29.898	30.55	29.22	54.5	71.1	58.5	61.4	101	6	74.1	51.5	51	53	53	52	88	56	84	76	46.04	.....

BALTIMORE, MD.

[Latitude, 39° 18′ N.; longitude, 76° 37′ W.]

J ..	30.027	30.82	28.96	26.2	32.9	28.3	29.1	57	2	36.0	22.9	20	23	22	21	78	68	76	74	4.48	1.90
F ..	30.057	30.54	29.29	26.4	37.0	30.6	31.3	67	-1	41.6	24.5	19	24	22	21	74	61	72	69	5.49	2.60
M .	29.920	30.41	29.26	37.3	47.3	40.3	41.6	71	15	49.6	34.8	28	28	30	28	71	52	69	64	4.85	1.14
A ..	30.052	30.49	29.35	49.5	61.7	52.6	54.6	88	34	64.4	46.9	42	43	44	43	78	55	75	69	2.06	1.22
M .	29.886	30.27	29.53	57.8	67.7	60.2	61.9	87	45	70.9	54.1	49	50	53	50	75	58	78	70	7.07	2.99
J ..	29.935	30.24	29.53	67.0	75.2	67.4	69.9	69	52	78.1	62.6	59	58	61	59	77	58	79	71	5.64	3.18
J ..	29.905	30.19	29.69	70.1	80.7	72.4	74.4	92	59	82.8	67.1	63	62	66	63	79	55	80	72	8.08	2.11
A ..	29.945	30.30	29.64	69.4	79.9	71.3	73.5	92	58	82.0	66.6	63	63	64	63	81	57	78	72	3.94	2.21
S ..	30.088	30.39	29.67	64.6	76.6	67.5	69.6	91	50	78.5	61.7	58	58	60	58	80	54	78	70	1.90	0.74
O ..	30.130	30.46	29.78	53.1	66.2	56.4	58.6	82	36	68.5	50.3	45	45	47	45	76	50	72	66	1.39	0.88
N ..	29.998	30.43	29.46	42.4	51.7	45.0	46.4	73	26	55.6	38.4	33	31	34	32	70	49	66	62	4.09	1.22
D ..	30.104	30.51	29.49	27.7	35.7	30.5	31.3	52	15	38.4	24.7	21	24	23	22	76	63	74	71	3.12	0.81
Y ..	30.004	30.82	28.96	49.3	59.4	51.9	53.5	92	-1	62.2	46.2	42	42	44	42	76	57	75	69	52.11	.....

Monthly and yearly meteorological summaries—Continued.

ATLANTA, GA.

[H=1,129. T=83. h=—.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.8	5.6	5.9	5.8	8,857	36	SE., W.	NW.	3	7	21	6	5	4	20	27	0	9	9	13	0	13	4	17	0	1	0	J.
4.7	4.1	3.5	4.1	7,800	32	NW.	NW.	5	1	12	10	7	10	15	24	0	13	9	6	0	7	1	13	0	0	0	F.
5.4	5.0	4.3	4.9	8,535	33	W.	NW.	3	1	8	13	6	16	21	24	1	7	19	5	0	11	0	4	0	1	0	M.
4.8	6.1	3.5	4.8	7,862	33	NW.	SE.	0	3	17	23	6	17	16	8	0	11	13	6	0	13	0	1	0	4	0	A.
2.9	4.3	2.3	3.2	7,091	32	NW.	SW.	4	4	8	6	7	25	20	19	0	16	13	2	0	9	0	0	0	10	0	M.
6.2	6.8	5.8	6.3	5,884	32	S.	SE.	2	5	16	20	8	13	14	11	1	6	12	12	0	21	0	0	0	11	0	J.
3.6	4.5	2.1	3.4	5,271	19	N.	W.	7	6	14	15	8	6	24	13	0	14	17	0	0	8	0	0	3	12	0	J.
3.8	6.5	3.3	4.5	5,241	26	NW.	NW.	4	12	11	12	11	13	12	16	2	10	15	6	0	11	0	0	7	5	0	A.
4.1	4.8	1.9	3.6	5,983	22	NW.	E.	1	12	31	14	6	7	7	11	1	14	14	2	0	4	0	0	0	1	0	S.
2.5	2.8	1.9	2.4	6,552	24	E.	E.	7	15	23	12	5	1	8	22	0	19	10	2	0	2	0	0	0	0	0	O.
4.9	5.2	4.1	4.7	7,262	30	S.	W.	2	1	3	8	8	17	26	24	1	9	14	7	0	10	0	7	0	1	0	N.
5.1	5.5	4.2	4.9	7,272	36	E.	W.	2	6	13	9	7	12	23	20	1	10	12	9	0	11	1	14	0	0	0	D.
4.5	5.1	3.6	4.4	83,610	...	....	NW.	40	73	177	148	84	141	206	219	7	138	157	70	0	120	6	56	10	46	0	Y.

ATLANTIC CITY, N, J.

[H=13. T=10. h=37.]

5.6	5.3	4.2	5.0	8,123	53	E.	NW.	11	25	3	5	0	5	16	26	2	8	16	7	0	14	6	26	0	0	0	J.
4.8	5.7	3.5	4.7	7,527	37	NW.	NW.	3	8	0	7	3	24	5	33	1	10	11	7	0	7	4	21	0	0	0	F.
4.5	5.3	2.9	4.2	7,930	31	NE.	NW.	2	10	7	5	5	19	10	35	0	11	16	4	0	10	2	17	0	1	0	M.
4.8	5.3	2.4	4.2	7,641	32	NE.	E.	1	15	24	7	6	22	7	8	0	12	13	5	4	6	0	1	0	3	0	A.
5.1	6.2	4.8	5.4	7,136	39	NE.	SW.	5	15	7	11	11	27	2	15	0	9	11	11	0	20	0	0	0	8	1	M.
5.9	5.0	5.2	5.4	5,643	35	SE.	SE.	7	10	12	19	11	16	6	9	0	5	19	6	0	10	0	0	0	1	1	J.
4.7	5.3	3.7	4.6	4,171	25	E., S.	SW.	1	10	11	10	13	29	6	8	5	9	15	7	1	9	0	0	0	3	1	J.
5.1	4.9	3.8	4.6	5,410	37	NE.	SW.	5	8	13	9	12	21	10	9	6	12	11	8	0	11	0	0	0	1	1	A.
4.7	4.7	2.5	4.0	6,460	22	S., SW.	E., SW.	10	11	17	6	11	17	6	11	1	12	14	4	0	9	0	0	0	2	0	S.
4.0	3.8	3.1	3.6	6,526	25	N.	NW.	16	8	10	14	10	12	4	19	0	17	7	7	0	7	0	0	0	2	0	O.
3.8	4.0	3.3	3.7	5,960	42	S.	W., NW	2	1	3	3	13	16	24	24	4	15	9	6	0	9	0	8	0	0	0	N.
5.1	5.6	3.9	4.9	7,026	36	NE.	NW.	10	17	2	1	3	16	20	21	3	11	10	10	0	14	5	23	0	0	0	D.
4.8	5.1	3.6	4.5	79,553	...	....	SW.	73	138	109	97	98	224	116	218	22	131	152	82	5	126	17	96	0	21	4	Y.

AUGUSTA, GA.

[H=183. T=47. h=39.]

5.9	6.0	5.1	5.7	4,210	25	W.	W.	9	13	7	7	2	7	28	11	9	9	9	13	0	10	4	16	0	0	0	J.
4.2	4.4	3.4	4.0	2,887	19	N., W.	W.	9	14	6	4	8	6	18	6	13	12	10	6	0	6	0	12	0	0	0	F.
5.9	5.8	3.8	5.2	3,776	24	SW.	W.	4	7	2	12	19	12	24	10	3	10	14	7	0	8	0	2	0	1	0	M.
4.5	5.7	3.4	4.5	3,228	24	NW.	E.	3	9	14	13	12	12	8	6	13	10	12	8	0	6	0	0	0	2	0	A.
3.1	4.2	2.8	3.4	2,785	26	W.	SW.	5	5	7	12	13	19	8	14	10	15	10	6	0	10	0	0	8	8	0	M.
6.4	7.0	5.8	6.4	2,502	24	NE.	NE.	4	21	5	12	9	12	7	8	12	5	11	14	0	17	0	0	11	7	0	J.
5.7	6.1	2.6	4.8	1,988	30	NE.	SW., SE	6	10	10	14	11	14	4	9	15	6	22	3	0	12	0	0	17	7	0	J.
4.6	6.3	4.6	5.2	2,515	16	SW., NE	SE.	9	15	5	16	14	7	11	5	11	9	14	8	0	9	0	0	17	4	0	A.
4.4	5.7	2.5	4.2	2,831	17	SW.	NE.	3	32	11	10	7	5	3	4	15	10	17	3	0	3	0	0	7	1	0	S.
1.5	3.1	1.1	1.9	2,493	17	N.	NE.	11	22	5	1	6	7	8	13	20	24	5	2	0	2	0	0	0	0	0	O.
3.8	4.2	2.8	3.6	2,395	20	W.	W.	2	0	4	4	14	12	24	12	18	13	12	5	0	7	0	8	0	0	0	N.
5.5	5.7	4.6	5.3	2,778	23	W.	W.	8	12	3	3	6	13	24	17	7	10	12	9	0	9	0	15	0	0	0	D.
4.6	5.4	3.5	4.5	34,388	...	....	W.	73	160	79	108	121	126	167	115	146	133	148	84	0	99	4	53	60	30	0	Y.

BALTIMORE, MD.

[H=45. T=75. h=69.]

6.8	6.6	4.5	6.0	4,789	27	SE.	N.	23	10	7	7	4	3	21	17	1	6	14	11	0	16	11	24	0	0	0	J.
4.5	5.2	3.5	4.4	4,821	36	NW.	NW.	10	12	4	7	4	13	9	24	1	8	16	4	0	8	4	19	0	0	0	F.
5.8	5.2	4.4	5.1	5,847	25	NW., SW.	NW.	6	9	9	14	2	15	7	31	0	8	14	9	0	12	2	10	0	0	0	M.
5.7	5.6	4.5	5.3	4,085	28	SW.	NE.	5	26	13	19	1	7	11	6	2	9	13	8	0	7	0	0	0	1	0	A.
6.1	7.0	4.5	5.9	4,235	20	SW.	NW.	7	14	8	17	6	14	5	20	2	8	10	13	0	17	0	0	0	5	0	M.
6.0	7.0	4.1	5.7	3,802	18	NW.	SE.	15	9	10	17	11	11	5	11	1	6	16	8	0	13	0	0	0	1	0	J.
4.9	5.6	4.1	4.9	3,508	23	NW.	SW.	14	7	8	15	10	17	9	10	3	13	9	9	0	12	0	0	2	5	0	J.
5.3	5.3	2.6	4.4	3,680	17	W.	NW.	10	13	6	15	11	7	12	16	3	12	13	6	0	8	0	0	1	2	0	A.
5.9	5.4	3.8	5.0	3,442	21	SW.	S.	9	16	6	11	18	8	10	8	4	6	19	5	0	8	0	0	1	2	0	S.
4.1	4.2	2.5	3.6	3,796	20	NW.	N., NW	20	14	7	13	6	5	5	20	3	16	10	5	0	7	0	0	0	0	0	O.
4.4	5.5	3.9	4.6	4,708	28	NW.	NW.	12	6	4	8	7	14	13	19	7	10	12	8	0	10	0	5	0	0	0	N.
6.2	5.6	4.5	5.4	4,028	26	NW.	NW.	16	17	5	7	7	5	6	24	6	9	11	11	0	16	7	24	0	0	0	D.
5.5	5.7	3.9	5.0	50,741	...	....	NW.	147	153	87	150	87	119	113	206	33	111	157	97	0	134	24	82	4	16	0	Y.

Monthly and yearly meteorological summaries—Continued.

BERING ISLAND, KAMCH.

[Latitude, 55° 12′ N.; longitude, 165° 55′ E.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.517	30.06	28.86	27.4	27.2	27.7	27.4	37	5	30.7	23.8	26	26	26	26	97	95	93	95	0.66	0.37
F ..	29.794	30.28	29.27	26.8	26.6	27.6	27.0	38	15	30.2	24.6	25	25	25	25	92	95	89	92	1.50	0.89
M ..	29.781	30.37	28.90	26.5	26.5	28.6	27.2	37	13	31.3	23.8	24	24	25	25	91	92	87	90	1.33	0.86
A ..	29.600	30.31	28.77	29.9	30.1	32.2	30.7	39	13	35.1	27.9	28	28	28	28	93	91	87	90	1.25	0.59
M ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
J ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
J ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
A ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
S ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
O ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
D ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Y ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

BISMARCK, DAK.

[Latitude, 46° 47′ N.; longitude, 100° 38′ W.]

J ..	28.318	28.74	27.75	-7.8	0.3	- 4.9	- 4.1	39	-37	7.5	-14.3	-15	- 7	-12	-11	76	74	76	75	0.62	0.19
F ..	28.191	28.65	27.71	10.8	20.7	15.9	15.8	56	-25	31.6	4.4	8	14	12	11	89	77	85	84	0.54	0.17
M ..	28.173	28.66	27.57	18.3	30.2	24.1	24.2	61	-18	35.6	14.9	16	23	21	20	89	75	87	84	0.94	0.45
A ..	28.119	28.61	27.52	35.3	54.5	44.6	44.8	81	9	57.5	33.7	32	33	35	33	87	47	69	68	1.49	0.54
M ..	28.131	28.42	27.71	49.2	69.1	57.8	58.7	92	30	72.5	46.5	42	42	43	42	78	40	59	59	1.73	0.68
J ..	28.170	28.49	27.77	55.7	75.6	64.5	65.3	92	41	78.2	53.2	50	49	51	50	80	41	63	61	2.03	0.60
J ..	28.138	28.47	27.74	64.9	86.1	74.7	75.2	101	51	89.5	62.5	54	53	53	53	69	34	49	51	1.43	0.53
A ..	28.134	28.38	27.88	59.1	80.0	69.6	69.6	104	34	83.3	57.7	51	51	52	51	77	40	56	58	1.45	0.51
S ..	28.123	28.43	27.63	44.9	65.0	53.0	54.3	92	22	69.0	43.0	38	38	38	38	78	40	60	59	0.38	0.22
O ..	28.209	28.82	27.80	38.7	57.1	46.2	47.3	81	19	60.4	36.1	32	36	36	35	79	50	69	66	0.65	0.33
N ..	28.198	28.68	27.65	20.4	31.3	22.6	24.8	58	- 8	38.2	14.9	17	17	17	17	86	62	79	76	1.24	0.80
D ..	28.311	28.92	27.76	1.0	8.0	3.5	4.2	47	-34	16.0	-5.0	(†)	4	2	2	95	85	96	92	0.76	0.29
Y ..	28.184	28.92	27.52	32.5	48.2	39.3	40.0	104	-37	53.3	29.0	27	30	29	28	82	55	71	69	13.26	....

BLOCK ISLAND, R. I.

[Latitude, 41° 10′ N.; longitude, 71° 36′ W.]

J ..	29.980	30.75	28.79	28.8	32.1	29.8	30.2	52	1	35.4	24.6	24	27	26	25	81	81	84	82	7.04	2.40
F ..	29.975	30.55	29.08	26.4	30.7	28.1	28.4	52	-1	35.8	22.1	21	25	23	23	81	78	80	80	8.89	4.54
M ..	29.855	30.49	29.24	31.3	37.5	33.8	34.2	56	6	40.6	28.4	26	30	29	28	82	75	82	79	5.42	1.79
A ..	30.097	30.61	29.48	43.5	48.6	43.5	45.2	70	32	52.1	40.6	40	44	42	42	90	84	93	89	3.26	2.45
M ..	29.879	30.34	29.47	51.6	57.1	51.7	53.5	73	42	59.8	48.6	48	50	49	49	87	79	90	86	4.14	1.81
J ..	29.949	30.28	29.46	59.9	64.9	59.1	61.3	74	48	67.2	56.3	57	59	57	58	90	82	94	89	2.15	1.10
J ..	29.914	30.21	29.68	67.3	72.6	66.2	68.7	80	58	74.4	62.9	64	67	64	65	89	82	93	88	1.68	0.76
A ..	29.939	30.33	29.49	65.5	70.8	65.4	67.2	80	54	72.9	62.0	63	65	63	64	91	84	92	89	2.47	0.76
S ..	30.093	30.41	29.65	63.3	68.0	63.1	64.8	78	50	70.0	59.9	59	62	60	60	88	81	91	86	2.90	2.33
O ..	30.124	30.52	29.72	53.1	57.7	53.6	54.8	71	35	60.1	49.3	49	51	49	50	87	80	86	84	4.71	2.48
N ..	29.957	30.40	29.36	44.9	49.0	45.8	46.6	63	32	52.7	40.2	40	42	40	41	84	79	82	82	5.16	1.92
D ..	30.057	30.56	29.37	32.2	35.2	34.5	34.0	54	15	40.8	28.7	28	30	31	30	84	82	86	84	6.70	1.54
Y ..	29.985	30.75	28.79	47.3	52.0	47.9	49.1	80	- 1	55.2	43.6	43	46	44	45	86	81	88	85	54.52	.....

BOISE CITY, IDAHO.

[Latitude, 43° 37′ N.; longitude, 116° 8′ W.]

J ..	27.216	27.70	26.54	24.1	32.2	28.3	28.2	53	- 1	36.8	19.0	21	25	24	24	88	75	86	83	2.96	0.49
F ..	27.284	27.66	26.72	33.9	45.8	40.0	39.9	65	23	51.3	31.3	30	31	32	31	86	57	73	72	0.94	0.32
M ..	27.170	27.51	26.85	32.7	46.2	41.1	40.0	69	22	50.0	29.7	27	24	27	26	80	43	60	61	0.82	0.23
A ..	27.086	27.54	26.65	39.8	53.9	48.8	47.5	74	29	58.7	37.4	33	30	33	32	78	42	58	59	2.43	0.50
M ..	27.168	27.46	26.95	46.5	68.3	62.5	59.1	91	26	73.5	44.7	38	37	41	39	75	34	48	52	0.61	0.40
J ..	27.121	27.32	26.93	53.0	76.6	71.1	66.9	96	39	81.7	51.6	44	43	44	44	71	32	40	48	0.44	0.23
J ..	27.114	27.30	26.91	60.8	85.1	79.2	75.0	107	44	91.1	58.3	48	47	46	47	64	28	33	42	0.24	0.23
A ..	27.099	27.24	26.89	59.3	84.9	77.0	73.7	97	48	90.1	55.3	42	44	45	44	53	25	33	37	(*)	(*)
S ..	27.193	27.49	26.92	46.4	70.8	60.0	59.1	88	28	75.8	42.3	34	35	35	34	63	28	42	44	(*)	(*)
O ..	27.213	27.57	26.94	41.4	56.8	48.4	48.9	82	25	60.9	37.3	35	35	35	35	79	47	02	63	0.72	0.21
N ..	27.375	27.73	26.56	26.6	40.9	32.7	33.4	58	9	44.3	22.5	22	25	26	24	83	54	77	71	0.43	0.28
D ..	27.297	27.73	26.88	35.1	41.1	36.9	37.7	60	21	44.0	30.2	30	32	32	31	83	72	84	80	2.64	0.52
Y ..	27.194	27.72	26.54	41.6	58.6	52.2	50.8	107	- 1	63.2	38.3	34	34	35	34	75	45	58	59	12.23	.....

* Inappreciable. † Zero.

Monthly and yearly meteorological summaries—Continued.

BERING ISLAND, KAMCH.

[$H = 20$. $T = 7$. $h = 9$.]

Cloudiness (in tenths). 7 a.m.	3 p.m.	11 p.m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days. Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
8.8	8.6	7.7	8.4	11,430	*37	NE.	NE.	26	29	28	3	2	1	0	4	0	0	8	23	0	13	17	30	0	0	0	J.
8.7	8.9	8.2	8.6	9,600	*26	E., N.	E.	16	22	33	6	1	1	1	4	0	0	5	23	0	12	17	25	0	0	0	F.
8.0	9.3	8.4	8.6	10,715	*41	S.	N.	21	12	11	10	13	12	4	9	1	0	7	24	0	11	13	29	0	0	0	M.
8.5	8.0	7.7	8.1	11,124	*42	S.	SW.	20	8	3	2	16	24	4	13	0	0	7	23	0	9	5	27	0	0	0	A.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	M.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	J.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	J.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	A.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	S.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	O.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	N.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	D.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Y.

BISMARCK, DAK.

[$H = 1,694$. $T = 18$. $h = 31$.]

7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.9	5.2	4.5	4.5	3,997	27	NW.	N.	27	7	8	4	1	1	11	18	15	9	16	5	0	11	29	31	0	0	1	J.
4.4	6.5	3.8	4.9	5,072	39	NE.	NW.	14	7	11	6	7	0	3	24	12	7	16	5	0	9	12	28	0	0	1	F.
6.0	6.6	4.3	5.6	5,016	37	NW.	N.	19	14	9	9	4	9	4	16	9	9	11	11	0	10	13	29	0	0	1	M.
4.3	5.2	3.9	4.5	6,876	42	N.	N.	28	5	12	19	9	4	2	4	7	12	10	8	0	6	2	12	0	1	1	A.
4.2	5.1	3.6	4.3	5,777	31	E.	NW.	14	7	6	14	7	11	8	19	7	11	18	2	0	7	0	1	1	3	2	M.
3.5	5.9	4.1	4.5	4,893	28	NE.	N.	20	4	13	10	15	5	3	9	11	7	20	3	0	11	0	0	1	5	1	J.
4.3	3.3	2.6	3.4	5,234	28	NW.	E.	15	13	19	13	10	2	7	13	1	14	16	1	0	6	0	0	16	6	1	J.
3.7	4.6	3.6	4.0	5,530	48	N.	S.	18	16	14	9	21	1	2	8	4	11	17	3	0	11	0	0	11	8	1	A.
3.4	4.9	2.0	3.4	6,328	40	NW.	NW.	15	5	9	6	8	2	4	35	6	11	17	2	0	5	0	4	1	1	0	S.
3.9	4.5	2.2	3.5	5,489	33	NW.	N.	17	8	10	12	15	4	6	14	7	16	11	4	0	6	0	10	0	1	2	O.
3.7	5.4	4.0	4.4	6,264	53	NW.	N.	29	6	8	11	3	4	2	26	1	10	14	6	0	7	9	29	0	0	0	N.
2.9	6.3	3.8	4.3	3,527	45	NW.	NW.	15	15	8	2	3	2	1	20	27	9	18	4	0	12	26	31	0	0	2	D.
4.0	5.3	3.5	4.3	64,003	...	....	N.	231	107	127	115	103	45	53	206	107	126	184	54	0	101	91	175	30	25	13	Y.

BLOCK ISLAND, R. I.

[$H = 27$. $T = 8$. $h = 23$.]

7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.4	7.1	5.7	6.4	14,124	64	NE.	NE.	20	22	5	8	1	5	11	20	1	6	13	12	0	17	8	23	0	0	0	J.
5.1	6.1	3.0	4.7	13,453	54	N., NW	SW.	15	8	1	6	3	23	12	16	0	8	16	4	0	9	10	21	0	0	0	F.
5.7	4.7	5.0	5.1	12,044	44	NW.	N., NW	17	13	5	6	6	15	9	17	5	8	16	7	1	12	3	18	0	0	0	M.
6.2	4.6	2.7	4.5	8,895	40	NE.	NE.	3	23	10	14	5	22	8	3	2	10	12	8	1	10	0	1	0	1	0	A.
4.9	5.7	5.6	5.4	10,533	38	NE.	SW.	11	15	7	11	6	30	8	4	1	6	19	6	1	12	0	0	0	1	0	M.
4.7	5.8	3.9	4.8	6,925	31	SW.	SW.	9	11	4	17	4	30	8	5	2	8	16	6	2	9	0	0	0	0	2	J.
3.8	4.3	4.0	4.0	7,442	30	SW.	SW.	8	9	2	10	8	46	7	2	1	13	14	4	0	9	0	0	0	3	1	J.
3.4	4.9	2.3	3.5	8,366	40	NE.	SW.	5	12	2	15	8	29	6	15	1	15	13	3	0	10	0	0	0	1	1	A.
3.8	6.0	5.3	5.0	8,897	34	NW.	SW.	9	12	9	12	9	23	4	12	0	8	16	6	0	8	0	0	0	1	0	S.
4.7	5.3	4.4	4.8	11,360	42	NE.	NE.	8	35	2	9	1	25	3	9	1	11	11	9	0	7	0	0	0	0	0	O.
6.3	5.4	3.5	5.1	10,018	52	SW.	SW.	11	6	0	8	8	23	12	22	0	7	15	8	0	9	0	0	0	2	0	N.
6.4	7.1	5.9	6.5	13,641	51	NE.	NW.	12	24	0	3	0	16	12	25	1	5	12	14	0	13	6	21	0	0	0	D.
5.1	5.6	4.3	5.0	125,698	...	....	SW.	128	190	47	119	59	287	100	150	15	105	173	87	5	125	27	84	0	9	4	Y.

BOISE CITY, IDAHO.

[$H = 2,750$. $T = 41$. $h = 32$.]

7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.0	6.7	5.4	5.7	2,907	26	SE.	SE.	4	3	4	40	2	0	7	18	15	8	13	10	0	18	11	25	0	0	0	J.
3.7	4.2	3.1	3.7	2,550	25	NW.	NW.	1	1	3	26	0	0	5	27	21	15	8	5	0	8	0	17	0	0	0	F.
4.3	5.5	3.4	4.4	4,666	30	NW.	SE.	4	2	7	36	3	1	8	28	4	11	16	4	0	10	0	22	0	0	0	M.
5.2	5.9	4.4	5.2	4,556	24	SE.	NW.	6	3	7	19	4	0	11	35	5	8	13	9	0	13	0	5	0	1	0	A.
3.0	3.8	2.8	3.2	3,122	20	NW., N	NW.	5	10	16	18	1	1	4	24	14	15	15	1	0	4	0	1	1	3	0	M.
1.9	2.8	1.9	2.2	3,302	21	NW.	NW.	13	0	15	15	3	0	4	34	6	20	9	1	0	4	0	0	5	4	1	J.
2.3	2.0	2.2	2.2	3,292	22	W.	NW.	12	5	12	12	5	2	8	31	6	21	9	1	0	2	0	0	14	7	0	J.
1.6	0.9	1.2	1.2	2,348	15	SE.	NW.	10	7	14	13	4	1	6	18	20	26	5	0	0	0	0	0	16	2	0	A.
1.1	1.4	0.6	1.0	2,399	21	NW.	NW.	4	2	4	25	4	1	2	36	12	26	3	1	0	0	0	1	0	0	0	S.
4.5	5.5	3.4	4.5	2,481	18	NW.	SE.	8	5	11	23	3	4	4	19	16	10	13	8	0	9	0	0	0	1	0	O.
2.8	4.3	2.8	3.3	2,463	21	SE.	SE.	6	2	4	28	4	4	5	26	11	17	10	3	0	3	1	30	0	0	0	N.
6.1	8.0	6.2	6.8	2,672	18	SE.	SE.	4	3	6	31	6	0	12	13	18	5	14	12	1	19	0	21	0	0	0	D.
3.5	4.2	3.1	3.6	36,758	...	....	NW.	77	43	103	286	39	14	76	309	148	182	128	55	1	90	12	131	36	18	1	Y.

* Taken from current velocities.

Monthly and yearly meteorological summaries—Continued.

BOSTON, MASS.

[Latitude, 42° 21′ N.; longitude, 71° 4′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.878	30.68	28.59	22.8	30.1	24.9	25.9	54	-10	32.7	18.7	16	21	19	18	74	70	77	74	7.08	1.68
F ..	29.849	30.59	28.82	23.3	30.7	25.7	26.6	57	-7	25.2	18.2	16	19	18	18	74	64	74	71	7.04	4.45
M ..	29.739	30.45	29.11	30.3	38.4	32.3	33.7	64	-1	40.5	26.2	22	25	25	24	71	62	76	70	3.20	1.15
A ..	29.993	30.49	29.44	45.8	51.1	46.1	47.7	84	27	56.7	40.6	35	37	38	37	69	63	74	69	1.70	1.39
M ..	29.770	30.22	28.33	53.9	60.5	54.3	56.2	85	38	65.3	48.3	44	45	45	45	69	61	74	68	3.08	1.42
J ..	29.834	30.14	29.31	61.2	67.0	61.0	63.1	82	50	70.8	55.6	52	51	53	52	73	62	77	71	1.34	.49
J ..	29.799	30.09	29.55	67.9	76.2	68.3	70.8	95	54	79.6	63.0	59	60	60	59	74	60	76	70	1.81	.99
A ..	29.824	30.22	29.35	64.1	73.5	65.4	67.7	90	49	76.8	59.7	57	58	57	57	78	60	77	72	3.64	.97
S ..	29.991	30.36	29.57	59.7	67.6	60.8	62.7	85	41	70.7	55.5	54	53	54	53	81	62	81	75	2.73	1.43
O ..	30.016	30.44	29.53	47.8	56.5	50.1	51.5	80	27	59.6	44.3	43	43	42	43	84	64	76	75	3.27	1.56
N ..	29.814	30.30	29.16	40.3	46.9	41.2	42.8	66	24	50.9	35.5	34	34	32	33	78	64	73	71	3.59	1.14
D ..	29.947	30.49	29.21	26.0	32.2*	28.1	28.8	55	6	36.1	20.6	19	20	20	20	75	64	71	70	3.66	.99
Y ..	29.871	30.68	28.59	45.3	52.6	46.5	48.1	95	-10	56.2	40.5	37	39	39	38	75	63	75	71	42.14	....

BROWNSVILLE, TEX.

[Latitude, 25° 53′ N.; longitude, 97° 26′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	30.038	30.59	29.61	46.5	62.4	51.1	53.3	79	22	65.0	43.6	43	47	47	46	89	62	87	80	1.81	.72
F ..	30.049	30.51	29.62	55.3	69.4	59.0	61.2	81	35	72.2	53.3	52	54	56	54	88	62	88	80	2.33	1.61
M .	29.931	30.29	29.59	61.4	73.0	63.9	66.1	83	43	74.8	58.7	59	60	60	60	92	67	89	83	1.15	.33
A ..	29.891	30.26	29.56	66.7	78.3	68.8	71.3	98	45	80.7	64.4	61	64	66	65	92	65	90	82	.17	.12
M ..	29.916	30.08	29.71	70.6	83.4	72.4	75.5	90	58	85.1	68.4	69	69	70	69	94	62	92	83	6.57	3.48
J ..	29.837	30.00	29.65	74.9	87.2	77.8	80.0	94	67	89.7	73.0	74	75	76	75	97	68	93	86	7.78	4.56
J ..	29.878	30.02	29.68	75.4	86.7	78.3	80.1	93	70	89.1	73.7	75	76	76	76	98	72	94	88	4.88	3.16
A ..	29.883	30.04	29.62	75.7	88.7	78.8	81.1	98	70	91.5	73.8	75	76	76	75	97	66	91	85	3.08	2.41
S ..	29.876	30.05	29.14	74.9	82.6	76.3	77.9	90	63	85.3	72.9	74	75	75	75	98	79	96	91	30.57	12.94
O ..	30.050	30.33	29.78	67.8	80.8	70.8	73.1	89	52	82.7	65.7	66	68	68	67	93	66	90	83	.55	.54
N ..	30.065	30.52	29.66	61.1	71.3	64.2	65.5	84	37	75.1	57.8	57	59	60	58	87	67	86	80	.48	.35
D ..	30.084	30.54	29.71	55.9	69.1	58.7	61.2	80	26	72.3	51.4	54	55	55	55	93	63	89	82	.69	.69
Y ..	29.958	30.59	29.14	65.5	77.7	68.3	70.5	98	22	80.3	63.1	63	65	65	64	93	67	90	83	60.06	.....

BUFFALO, N. Y.

[Latitude, 42° 53 N.; longitude, 78° 53′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	29.248	29.97	28.42	20.0	24.4	21.0	22.1	58	-1	29.1	16.5	18	20	18	18	87	85	87	86	4.22	1.26
F ..	29.282	29.82	28.46	20.4	26.2	23.7	23.4	56	-12	32.6	16.0	16	20	19	18	84	78	84	82	4.00	1.13
M ..	29.179	29.67	28.44	28.6	34.2	30.3	31.0	68	1	38.3	25.8	25	28	26	26	88	77	84	83	4.23	1.33
A ..	29.345	29.70	28.74	42.5	51.0	45.4	46.3	78	24	55.2	39.4	37	40	39	38	82	68	78	76	3.25	1.22
M ..	29.193	29.59	28.77	50.5	57.1	51.8	53.1	77	39	60.8	46.4	46	46	46	46	84	69	82	78	4.69	1.44
J ..	29.233	29.48	28.80	60.6	68.3	62.1	63.7	85	46	70.8	55.8	54	55	55	55	80	64	79	75	3.39	1.21
J ..	29.224	29.40	29.01	64.2	73.2	68.2	68.5	87	51	75.2	60.6	58	60	60	59	81	65	76	74	1.34	.68
A ..	29.248	29.55	28.90	63.6	72.3	66.5	67.5	86	47	74.8	59.6	57	58	58	58	79	64	75	73	2.77	1.63
S ..	29.342	29.66	28.98	58.8	68.5	60.8	62.7	83	44	71.4	55.0	52	53	54	53	79	60	80	73	5.98	1.40
O ..	29.423	29.75	28.67	49.0	56.0	51.0	52.0	71	34	59.3	45.4	44	46	45	45	84	72	82	79	1.67	.47
N ..	29.219	29.69	28.50	35.9	39.4	36.6	37.3	62	22	44.4	32.1	32	33	31	32	86	80	80	82	6.05	1.38
D ..	29.343	29.88	28.60	22.1	25.7	22.9	23.6	48	-3	31.9	17.3	19	21	19	20	86	82	87	85	3.26	1.22
Y ..	29.273	29.97	28.42	43.1	49.7	45.0	45.9	87	-12	53.6	39.2	38	40	39	39	83	72	81	79	44.85	.....

CAIRO, ILL.

[Latitude, 37° 0′ N.; longitude, 89° 10′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	29.715	30.27	29.22	23.1	27.7	25.5	25.4	57	-9	32.4	17.4	18	20	19	19	82	75	79	79	3.82	1.57
F ..	29.761	30.31	29.24	30.3	40.5	34.6	35.1	60	-3	42.7	26.9	23	23	25	25	77	53	70	67	2.54	1.20
M ..	29.628	30.09	28.99	40.4	48.7	45.1	44.7	79	23	52.0	37.5	32	32	32	32	75	58	64	65	2.84	.79
A ..	29.645	29.94	29.29	52.9	63.1	57.9	58.0	80	29	65.4	50.9	46	44	45	45	78	55	65	66	6.64	1.93
M ..	29.589	29.91	29.27	62.6	75.8	67.7	68.7	88	48	77.4	60.8	57	57	60	58	83	53	77	71	2.98	.89
J ..	29.593	29.83	29.40	67.4	77.0	71.2	71.9	88	55	79.4	65.9	63	62	65	63	85	64	81	76	4.87	1.25
J ..	29.588	29.78	29.40	71.8	86.0	76.4	78.1	93	62	87.0	70.0	68	65	70	68	88	51	81	73	1.01	.62
A ..	29.612	29.81	29.38	70.7	84.9	74.9	76.8	97	58	85.8	69.6	68	67	68	68	91	56	81	76	2.84	.88
S ..	29.711	29.88	29.50	64.7	78.7	69.0	70.8	88	51	79.7	63.4	61	60	62	61	88	55	81	75	2.52	1.00
O ..	29.826	30.09	29.24	50.9	69.8	57.8	59.5	83	32	70.5	49.8	47	43	51	47	86	40	78	68	.45	.31
N ..	29.713	30.13	29.19	39.8	51.6	44.6	45.3	74	25	53.8	37.1	34	31	33	33	81	49	66	65	5.73	1.97
D ..	29.805	30.12	29.33	27.1	34.7	30.4	30.7	57	11	38.0	24.5	22	23	23	23	82	66	73	74	1.74	.91
Y ..	29.682	30.31	28.99	50.1	61.5	54.6	55.4	97	-9	63.7	47.8	45	44	46	45	83	56	75	71	37.98	.....

***Monthly and yearly meteorological summaries*—Continued.**

BOSTON, MASS.

[H=124. T=116. h=174.]

Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.8	5.6	5.5	5.6	9,323	64	NE.	W.	18	13	4	9	0	5	23	21	0	9	11	11	0	18	13	26	0	0	0	J.
4.5	6.2	4.7	5.1	10,621	49	NW.	W.	6	9	1	3	4	10	27	24	0	10	10	8	1	10	13	22	0	0	0	F.
5.9	5.6	5.4	5.6	10,628	41	E.	NW.	8	5	11	9	4	11	12	33	0	7	15	9	0	17	3	23	0	0	0	M.
5.2	5.0	4.1	4.8	7,664	51	E.	E.	6	10	25	9	5	13	15	7	0	10	14	6	0	9	0	5	0	0	1	A.
5.1	5.0	5.8	5.3	8,640	36	E.	W.	8	8	10	17	3	13	20	14	0	5	19	7	0	13	0	0	0	2	0	M.
5.3	5.6	4.7	5.2	7,206	27	W.	W.	8	4	20	11	1	13	27	6	0	9	12	9	0	12	0	0	0	0	3	J.
3.9	5.2	2.5	3.9	6,969	27	S.	W.	7	6	12	9	2	17	30	10	0	12	14	5	0	8	0	0	2	2	2	J.
3.8	3.5	3.0	3.4	7,152	34	W.	W.	6	9	7	11	5	10	28	17	0	13	15	3	1	12	0	0	1	1	1	A.
4.8	5.3	4.9	5.0	7,680	32	W.	W.	12	5	12	6	9	9	22	14	1	10	11	9	0	10	0	0	0	1	0	S.
3.7	4.7	3.5	4.0	8,558	40	E.	W.	9	13	12	8	6	10	24	11	0	16	9	6	0	9	0	1	0	1	0	O.
4.9	5.1	3.6	4.5	8,584	44	NE.	W.	4	4	4	4	10	10	38	15	1	10	13	7	0	12	0	7	0	1	0	N.
6.5	5.7	5.5	5.9	9,933	37	W.	W.	16	12	0	2	5	7	32	19	0	6	12	13	0	12	11	27	0	0	0	D.
5.0	5.2	4.4	4.9	102,958	..	....	W.	108	98	118	98	54	128	298	191	2	117	155	93	2	142	40	111	3	8	7	Y.

BROWNSVILLE, TEX.

[H=57. T=17. h=34.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.6	5.7	4.0	4.4	6,061	36	N.	N.	29	7	7	3	23	3	3	14	4	13	10	8	0	6	0	4	0	0	0	J.
4.9	6.7	4.0	5.2	6,060	29	S.	S.	21	13	8	3	25	2	2	3	7	8	9	11	0	8	0	0	0	1	0	F.
6.4	6.4	6.2	6.3	6,574	31	S.	S.	19	15	16	6	25	2	1	2	7	6	11	14	0	11	0	0	0	0	0	M.
5.8	6.5	4.4	5.6	6,624	26	S.	SE.	6	5	14	39	23	3	0	0	0	6	15	9	0	4	0	0	3	1	0	A.
4.2	3.6	2.0	3.3	6,635	27	S.	S.	3	7	19	24	28	9	1	0	2	16	12	3	0	5	0	0	0	0	0	M.
3.9	4.9	3.0	3.9	4,102	20	SW.	S.	2	5	18	21	29	6	2	3	4	12	14	4	0	10	0	0	15	1	0	J.
3.4	5.5	1.6	3.5	4,599	24	E.	SE.	0	7	8	46	21	5	2	1	3	13	16	2	0	7	0	0	12	2	0	J.
3.2	5.0	.7	3.0	4,768	19	SE.	SE.	4	7	25	30	21	0	2	1	3	20	9	2	0	4	0	0	24	3	0	A.
5.8	7.0	3.2	5.3	5,595	68	E.	S.	16	14	13	14	23	2	3	2	3	7	17	6	0	20	0	0	1	1	0	S.
1.9	3.7	.6	2.1	4,347	20	SE.	N.	25	24	21	5	7	1	4	1	5	22	8	1	0	2	0	0	0	0	0	O.
4.1	5.4	3.0	4.2	6,096	28	N.	S.	22	5	17	3	25	5	2	5	4	14	9	5	0	7	0	0	0	0	0	N.
2.1	4.3	.6	2.3	5,286	28	S.	S.	25	8	4	17	28	5	4	0	2	20	11	0	0	2	0	2	0	0	0	D.
4.1	5.4	2.8	4.1	66,747	..	....	S.	172	117	170	211	278	43	26	32	44	157	141	65	0	86	0	6	55	9	0	Y.

BUFFALO, N. Y.

[H=690. T=99. h=91.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
8.1	8.7	7.6	8.1	9,181	48	SW.	W.	2	15	11	13	10	15	21	6	0	1	8	22	0	24	16	29	0	0	0	J.
7.4	7.5	7.1	7.3	9,264	57	W.	SW.	7	6	5	3	17	22	18	5	1	3	9	16	0	19	10	22	0	0	0	F.
7.7	7.3	6.3	7.1	8,640	36	SW.	SW.	9	16	6	5	8	26	15	8	0	5	9	17	0	18	6	23	0	1	0	M.
5.2	5.9	4.9	5.3	6,945	46	SW.	NE.	10	26	8	3	11	24	6	2	0	8	13	9	1	13	0	8	0	0	0	A.
4.9	6.0	2.9	4.6	6,614	33	SW.	SW,	11	11	4	3	9	44	5	5	1	9	15	7	0	12	0	0	0	3	1	M.
4.8	4.7	3.4	4.3	5,824	32	SW.	SW.	4	8	7	1	16	38	11	5	0	12	10	8	0	10	0	0	0	1	0	J.
5.3	4.5	3.5	4.4	5,304	22	SE. SW. W.	SW.	8	11	6	2	8	33	18	6	1	13	12	6	0	8	0	0	0	2	0	J.
4.3	5.4	3.0	4.2	5,709	28	S.	S.	7	16	5	8	20	15	16	5	1	12	14	5	0	10	0	0	0	0	0	A.
3.9	5.0	4.0	4.3	7,263	44	SW.	W.	2	6	11	6	19	16	24	6	0	12	12	6	0	15	0	0	0	1	0	S.
5.9	6.2	4.4	5.5	8,070	63	SW.	SW.	3	16	4	4	16	24	18	8	0	9	11	11	0	14	0	0	0	1	0	O.
7.3	8.1	6.8	7.4	11,577	58	SW.	W.	7	8	2	6	13	15	35	4	0	5	6	19	0	18	2	18	0	1	1	N.
8.4	8.2	6.9	7.8	9,584	44	W.	W.	5	15	10	3	12	13	32	3	0	1	13	17	0	19	13	27	0	0	0	D.
6.1	6.5	5.1	5.9	93,975	..	.. ....	SW.	75	154	79	57	159	285	219	63	4	90	132	143	1	180	47	127	0	10	2	Y.

CAIRO, ILL.

[H=359. T=88. h=78.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.3	6.9	5.6	6.3	6,490	33	SW.	W.	10	5	12	10	13	5	22	16	0	7	11	13	0	16	10	28	0	0	0	J.
5.3	4.8	3.7	4.6	5,922	28	NW.	NW.	13	1	12	14	12	9	6	15	2	12	8	8	0	10	5	18	0	0	0	F.
7.2	7.7	5.5	6.8	8,457	44	W.	N.	18	10	5	7	15	13	13	12	0	6	11	14	0	11	0	8	0	4	0	M.
6.9	7.1	4.6	6.2	6,282	29	NW.	S.	13	8	7	19	23	4	9	6	1	5	13	12	0	12	0	4	0	6	0	A.
5.1	5.9	3.7	4.9	5,899	37	S.	S.	17	8	10	11	19	12	5	7	4	8	16	7	0	13	0	0	0	11	0	M.
6.8	7.3	4.2	6.1	4,313	28	S.	N.	19	9	16	9	7	9	6	11	4	6	9	15	0	17	0	0	0	8	0	J.
3.4	5.2	3.2	3.9	3,334	25	SW.	N., SW.	23	6	6	1	7	23	7	5	15	13	12	6	0	5	0	0	5	5	0	J.
5.2	5.7	3.2	4.7	4,308	38	NW.	S.	11	5	17	5	20	19	6	9	1	6	23	2	0	10	0	0	10	11	0	A.
4.7	5.2	3.1	4.3	4,409	30	N.	S.	5	9	9	9	32	10	4	7	5	11	12	7	0	9	0	0	0	2	0	S.
2.7	3.2	1.5	2.5	4,441	32	SW.	N.	23	6	14	7	15	6	10	7	5	18	10	3	0	4	0	0	0	0	0	O.
4.9	6.1	3.9	5.0	6,341	32	W., SW	S.	11	5	5	4	25	18	12	10	0	10	11	9	0	13	0	10	0	3	0	N.
6.7	7.0	5.2	6.3	6,848	32	NW., N	N.	25	5	7	9	17	3	10	17	0	5	12	14	0	11	11	24	0	0	0	D.
4.5	6.0	4.0	5.1	67,053	..	....	S.	188	77	120	105	205	131	110	122	37	107	148	110	0	131	26	92	15	50	0	Y.

Monthly and yearly meteorological summaries—Continued.

CAPE HENRY, VA.

[Latitude, 36° 56′ N.; longitude, 76° W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	30.037	30.78	29.01	32.5	35.9	35.0	34.5	60	11	41.6	28.7	27	30	30	29	82	78	82	81	2.99	.97
F ..	30.093	30.58	29.36	33.1	40.3	36.3	36.6	72	5	45.4	29.0	27	30	29	29	79	69	74	74	3.39	1.45
M .	29.967	30.37	29.34	41.3	47.8	44.6	44.6	78	21	52.8	37.7	34	36	36	36	76	68	76	74	1.75	.55
A ..	30.072	30.41	29.42	51.8	56.3	52.3	53.5	84	38	60.3	47.0	46	48	47	47	83	76	82	81	1.98	1.60
M .	29.922	30.35	29.48	60.8	66.9	61.6	63.1	86	46	71.4	55.7	55	58	56	56	82	76	84	81	7.25	2.26
J ..	29.968	30.26	29.61	68.7	73.0	68.7	70.1	94	58	75.4	64.7	64	64	64	64	85	76	85	82	4.23	.73
J ..	29.939	30.17	29.74	73.5	78.5	73.5	75.2	90	65	80.9	69.6	70	71	69	70	89	78	86	84	4.37	1.37
A ..	29.971	30.29	29.69	72.7	76.6	73.0	74.1	91	65	79.0	70.2	68	69	68	68	87	78	84	83	5.27	1.08
S ..	30.114	30.35	29.78	70.6	74.9	70.6	72.0	89	59	77.0	67.7	65	65	64	64	83	72	80	79	4.98	3.21
O ..	30.151	30.46	29.85	59.8	66.0	61.7	62.5	79	47	68.4	56.9	54	55	54	54	83	70	78	77	.63	.60
N ..	30.060	30.43	29.50	49.7	57.4	50.9	52.7	75	32	60.4	44.7	41	42	41	41	72	59	70	67	2.76	1.09
D ..	30.113	30.51	29.48	36.2	41.4	38.4	38.7	58	19	45.7	32.4	31	34	33	32	82	76	81	79	5.16	1.14
Y ..	30.034	30.78	29.01	54.2	59.6	55.6	56.5	94	5	63.2	50.4	49	50	49	49	82	73	80	78	44.76	.....

CAPE MENDOCINO, CAL.

[Latitude, 40° 26′ N.; longitude, 124° 24′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	29.337	29.68	28.38	45.0	50.3	48.7	48.0	61	34	52.7	43.5	42	46	45	44	90	87	88	88	4.61	.81
F ..	29.410	29.66	29.02	48.0	52.6	50.3	50.3	61	34	54.5	46.1	44	47	45	46	88	82	84	85	1.37	.49
M .	29.383	29.65	28.99	43.4	48.9	46.1	46.1	56	36	51.1	41.5	38	42	40	40	82	78	81	80	2.08	.63
A ..	29.304	29.62	28.96	44.7	50.2	47.6	47.5	63	38	52.9	42.9	41	45	42	43	88	82	82	84	5.43	1.37
M .	29.355	29.58	29.09	48.0	54.7	51.2	51.3	64	40	57.5	46.4	44	48	47	46	87	80	85	84	.35	.14
J ..	29.372	29.53	29.22	51.1	56.7	54.2	54.0	66	47	59.6	49.9	47	50	49	48	85	78	83	82	.04	.03
J ..	29.305	29.49	29.14	52.5	58.2	55.6	55.4	71	48	61.9	51.4	50	53	51	51	90	83	84	86	.46	.22
A ..	29.281	29.38	29.18	53.5	60.0	56.2	56.6	71	46	63.8	51.9	50	54	52	52	89	82	86	86	.26	.06
S ..	29.309	29.44	29.17	54.7	60.5	56.4	57.2	85	47	64.0	52.8	49	51	50	50	83	75	82	80	.15	.04
O ..	29.390	29.59	29.22	51.1	56.1	51.9	53.0	65	44	58.1	49.8	47	50	47	48	86	80	84	84	3.04	.72
N ..	29.482	29.73	29.02	49.2	53.6	51.2	51.3	68	40	56.7	47.4	43	46	45	45	81	76	80	79	1.07	.47
D ..	29.424	29.70	29.00	48.8	52.7	51.0	50.8	64	42	55.4	47.8	46	49	48	48	90	86	89	89	3.49	1.13
Y ..	29.363	29.73	28.38	49.2	54.5	51.7	51.8	85	34	57.4	47.6	45	48	47	47	87	81	84	84	22.35	.....

CEDAR KEYS, FLA.

[Latitude, 29° 8′ N.; longitude, 83° 2′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	30.030	30.48	29.60	45.7	53.7	48.3	49.2	73	15	57.2	42.9	43	48	45	45	91	80	90	87	1.86	1.21
F ..	30.095	30.52	29.83	49.7	59.3	53.1	54.0	73	26	61.7	47.4	46	51	49	48	87	76	86	83	1.17	.50
M .	30.016	30.38	29.66	56.6	62.4	58.7	59.2	77	36	65.5	54.4	54	55	55	55	90	78	88	86	12.14	2.79
A ..	30.007	30.26	29.71	61.4	71.5	64.5	65.8	81	44	73.8	59.4	58	60	60	59	88	69	85	81	1.61	1.36
M .	30.001	30.18	29.83	71.3	77.9	72.8	74.0	87	59	79.6	68.8	65	67	67	66	80	69	81	77	.71	.40
J ..	29.981	30.18	29.73	78.8	83.7	78.6	80.4	90	66	86.2	74.4	74	73	73	74	85	72	85	81	7.81	2.77
J .	30.004	30.20	29.80	79.2	82.4	79.4	80.3	88	68	84.5	74.9	74	73	74	73	84	73	83	80	11.72	2.63
A ..	30.006	30.21	29.83	78.8	84.0	79.7	80.8	93	69	87.0	75.0	74	73	74	74	85	72	83	80	7.08	2.84
S ..	30.061	30.18	29.93	76.3	84.1	77.9	79.4	91	69	86.6	73.1	72	72	72	72	87	67	82	79	1.38	.58
O ..	30.105	30.27	29.88	66.5	77.6	69.4	71.2	85	47	79.5	63.8	60	62	62	61	81	59	78	73	2.53	1.84
N ..	30.184	30.41	29.96	54.8	66.1	59.2	60.0	81	37	71.9	51.9	48	51	52	50	78	61	78	72	.58	.46
D ..	30.158	30.42	29.83	50.8	58.4	54.0	54.4	70	30	62.1	47.8	47	50	50	49	87	76	85	83	1.95	.49
Y ..	30.054	30.52	29.60	64.2	71.8	66.3	67.4	93	15	74.6	61.2	60	61	61	61	85	71	84	80	50.54	.....

CHARLESTON, S. C.

[Latitude, 32° 47′ N.; longitude, 79° 56′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	30.019	30.65	29.37	38.7	48.1	41.6	42.8	70	10	50.7	35.0	33	38	35	36	82	70	80	77	5.64	1.63
F ..	30.101	30.61	29.75	43.2	53.1	46.6	47.6	72	13	56.3	39.7	34	36	40	37	73	57	79	69	2.13	1.29
M .	29.998	30.34	29.54	49.8	58.5	53.3	53.9	76	30	61.7	46.4	45	46	46	46	84	67	79	77	2.60	.85
A ..	30.031	30.35	29.56	58.7	68.0	60.6	62.4	81	39	70.7	55.5	53	53	55	54	82	60	82	75	1.19	.69
M .	29.954	30.21	29.67	69.2	78.3	70.9	72.8	94	50	81.0	65.3	61	60	63	62	77	54	78	70	1.00	.50
J ..	29.945	30.12	29.72	75.2	80.9	75.8	77.3	89	67	83.6	71.5	69	70	71	70	82	71	86	80	10.78	2.95
J ..	29.923	30.12	29.76	77.2	84.3	78.2	79.9	92	65	86.8	73.7	72	73	73	73	84	70	84	79	4.16	1.88
A ..	29.950	30.16	29.71	75.7	82.0	77.0	78.2	92	66	85.3	73.3	72	72	72	72	87	74	86	82	3.28	.99
S ..	30.059	30.23	29.81	72.7	80.3	75.4	76.1	88	60	83.3	70.5	69	70	71	70	89	73	86	82	3.03	.94
O ..	30.116	30.32	29.87	61.4	72.8	65.4	66.5	86	45	75.1	59.6	57	58	58	58	85	63	78	75	.01	.01
N ..	30.104	30.34	29.80	51.5	63.4	56.4	57.1	78	35	66.9	48.5	44	46	48	46	76	56	76	69	.33	.11
D ..	30.095	30.43	29.60	44.2	53.7	47.4	48.4	72	25	55.7	41.9	40	44	41	42	85	73	79	79	1.79	1.00
Y ..	30.024	30.65	29.37	59.8	68.6	62.4	63.6	94	10	71.4	56.7	54	56	56	55	82	66	81	76	35.94	.....

Monthly and yearly meteorological summaries—Continued.

CAPE HENRY, VA.

[$H = 16.$ $T = 16.$ $h = 6.$]

Cloudiness (in tenths.)				Wind.													Number of days—										
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.3	4.8	3.0	4.4	10,435	60	NE.	NW.	23	7	3	4	7	9	10	27	3	6	20	5	4	9	5	19	0	0	0	J.
3.4	3.0	2.2	2.9	10,228	52	N.	NW.	9	8	1	6	14	13	9	17	7	17	8	3	1	7	2	15	0	0	0	F.
3.5	4.1	2.8	3.5	11,209	48	NW.	SW.	13	13	8	5	9	18	12	13	2	16	10	5	0	9	0	6	0	0	0	M.
3.0	4.3	4.2	3.8	9,705	40	NE.	NE.	4	32	10	11	10	10	4	5	4	14	10	6	4	8	0	0	0	0	0	A.
5.2	4.2	2.9	4.1	10,796	60	NW.	SW.	7	11	16	9	13	20	5	10	2	12	13	6	0	12	0	0	0	5	0	M.
5.4	6.2	4.4	5.3	8,329	34	N., E.	NE.	3	19	18	14	10	14	5	4	3	8	11	11	0	17	0	0	1	3	0	J.
4.5	4.6	3.8	4.3	7,152	36	E., NW.	SW.	4	15	17	13	18	19	1	3	3	13	11	7	0	12	0	0	1	1	0	J.
5.1	5.9	4.1	5.0	9,439	44	NE.	NE.	11	25	9	11	11	19	3	5	2	9	14	8	0	15	0	0	1	2	0	A.
4.2	4.1	3.5	3.9	9,612	38	N.	NE.	11	22	11	7	13	12	3	2	6	14	9	7	0	5	0	0	0	1	0	S.
4.5	3.0	1.9	3.1	9,920	44	NW.	NE., NW.	16	18	10	3	12	7	7	18	2	16	14	1	0	2	0	0	0	0	0	O.
3.7	4.0	2.9	3.5	9,350	60	W.	NW.	8	4	3	10	13	18	10	22	2	15	9	6	0	9	0	1	0	2	0	N.
5.8	5.2	4.4	5.1	11,159	47	NW.	SW., NW.	14	13	1	2	8	20	14	20	1	7	16	8	0	15	2	14	0	0	0	D.
4.5	4.4	3.3	4.1	117,334	...	....	NE.	123	187	107	95	138	179	83	146	37	147	145	73	9	120	9	55	3	14	0	Y.

CAPE MENDOCINO, CAL.

[$H = 637.$ $T = 5.$ $h = 1.$]

5.2	5.0	5.5	5.2	15,736	144	SE.	SE.	22	2	0	46	8	1	1	10	3	9	12	10	5	18	0	0	0	0	0	J.
4.5	4.1	4.4	4.3	12,926	75	SE.	NW.	23	1	1	20	12	0	1	25	1	10	11	7	3	8	0	0	0	0	0	F.
5.2	4.9	5.9	5.3	16,401	70	SE.	NW.	21	0	0	25	17	0	1	29	0	9	13	9	1	10	0	0	0	0	0	M.
5.7	5.3	5.8	5.6	15,527	80	SE.	NW.	19	1	0	21	9	2	2	35	1	6	15	9	1	11	0	0	0	0	0	A.
4.9	4.7	6.9	5.5	18,018	80	SE.	N.	26	1	0	23	14	0	1	19	1	6	16	6	3	3	0	0	0	0	0	M.
4.2	3.5	4.6	4.1	16,427	52	N.	N.	68	0	0	0	1	0	0	20	1	9	17	4	2	0	0	0	0	0	0	J.
2.9	3.4	4.5	3.6	16,708	56	S.	N.	68	1	0	4	8	1	0	11	0	12	17	2	10	1	0	0	0	0	0	J.
2.3	2.2	2.8	2.4	12,602	42	N.	N.	75	3	0	7	4	0	0	3	1	16	14	1	7	0	0	0	0	0	0	A.
2.8	2.3	2.4	2.5	11,360	45	N.	N.	45	6	2	13	8	0	0	13	3	17	11	2	7	0	0	0	0	0	0	S.
5.2	4.5	5.3	5.0	11,876	44	N., S.	N.	50	1	0	6	29	1	0	5	1	9	16	6	0	11	0	0	0	0	0	O.
4.3	3.2	3.1	3.5	10,564	64	SE.	N.	53	7	2	8	10	0	1	6	3	16	10	4	1	6	0	0	0	0	0	N.
4.8	6.2	6.2	5.7	18,815	88	S.	SE.	19	3	1	37	29	1	0	2	1	2	20	9	0	16	0	0	0	0	0	D.
4.3	4.1	4.8	4.4	176,960	...	....	N.	489	26	6	210	149	6	7	178	16	121	172	69	40	84	0	0	0	0	0	Y.

CEDAR KEYS, FLA.

[$H = 22.$ $T = 45.$ $h = 35.$]

5.4	6.9	5.6	6.0	6,892	32	W.	W.	10	12	12	3	11	4	20	17	4	6	14	11	1	10	1	6	0	1	0	J.
3.5	4.9	3.4	3.9	5,495	25	NW.	NE.	12	17	7	3	12	5	16	9	3	13	9	6	1	8	0	2	0	0	0	F.
6.9	6.5	5.8	6.4	7,288	23	W.	NE., W	8	16	11	7	14	3	16	12	6	6	12	13	0	16	0	0	0	3	0	M.
4.2	5.2	3.5	4.3	7,377	34	S.	NE.	5	27	10	5	6	6	21	5	5	13	10	7	0	7	0	0	0	2	0	A.
4.5	4.3	3.1	4.0	6,453	34	NW.	W.	2	6	3	5	5	20	41	8	3	13	14	4	0	4	0	0	0	1	0	M.
6.8	6.8	6.6	6.7	6,752	68	E.	SW.	4	5	19	10	8	22	14	4	4	3	14	13	0	12	0	0	1	8	0	J.
8.2	7.8	7.8	7.9	7,012	35	SE.	SW.	3	2	6	8	18	33	19	3	1	0	12	19	0	21	0	0	0	5	0	J.
6.2	6.[illegible]	4.5	5.8	6,136	32	W.	SW.	7	17	11	8	11	24	12	3	0	5	15	11	0	12	0	0	7	5	0	A.
4.6	6.6	4.8	5.3	6,646	27	NE.	NE.	5	46	8	2	2	5	15	5	2	5	17	8	0	9	0	0	4	0	0	S.
3.3	4.8	2.5	3.5	7,448	32	NE.	NE.	14	50	7	1	1	2	11	6	1	17	10	4	0	4	0	0	0	0	0	O.
2.6	3.7	2.3	2.9	5,496	34	S.	N.	19	13	6	5	13	6	12	8	8	16	12	2	0	2	0	0	0	0	0	N.
5.5	5.1	4.8	5.1	6,050	38	NW.	NE.	8	21	12	4	12	2	20	13	1	8	12	11	0	15	0	2	0	0	0	D.
5.1	5.8	4.6	5.2	79,045	...	....	NE.	97	232	112	61	113	132	217	93	38	105	151	109	2	120	1	10	12	25	0	Y.

CHARLESTON, S. C.

[$H = 52.$ $T = 61.$ $h = 53.$]

4.3	5.6	4.5	4.8	5,975	29	W.	N., W.	18	14	9	6	3	3	18	14	8	9	19	3	1	12	3	8	0	1	0	J.
4.2	4.9	2.7	3.9	4,580	24	NW.	NE.	10	15	6	3	8	10	10	9	13	12	11	5	0	7	1	4	0	1	0	F.
6.1	6.8	4.0	5.6	5,556	26	S.	SW., W	5	9	12	6	6	18	18	10	9	6	16	9	0	10	0	1	0	2	0	M.
4.9	5.3	2.6	4.3	6,082	32	NE.	E.	6	15	28	2	7	19	7	4	2	13	12	5	0	7	0	0	0	2	0	A.
3.1	5.0	2.4	3.5	6,217	24	E.	SW.	4	2	7	9	15	29	11	11	5	15	11	5	0	5	0	0	3	4	0	M.
6.9	7.3	5.9	6.7	5,869	44	E.	E.	6	5	22	5	15	21	10	2	4	3	12	15	0	15	0	0	0	10	0	J.
5.5	6.7	4.1	5.4	4,899	28	SW.	SW.	4	6	10	4	22	29	9	3	6	6	19	6	0	14	0	0	2	6	0	J.
5.4	6.2	4.1	5.2	5,313	21	NE.	SW.	4	14	6	6	21	25	5	3	9	11	10	10	0	13	0	0	2	2	0	A.
4.7	4.9	2.7	4.1	5,323	24	E.	E.	14	13	23	6	9	1	5	3	12	8	16	4	0	10	0	0	0	1	0	S.
3.5	4.5	2.0	3.3	5,647	26	NE.	NE.	22	28	15	5	2	4	4	9	4	15	12	4	0	1	0	0	0	1	0	O.
4.4	4.4	2.6	3.8	4,899	28	SW.	SW.	12	7	5	11	5	22	10	11	7	13	14	3	0	5	0	0	0	0	0	N.
5.8	6.3	4.0	5.4	5,084	24	NW.	W.	15	15	5	9	0	9	17	10	13	10	9	12	0	11	0	5	0	0	0	D.
4.9	5.7	3.5	4.7	65,444	...	....	SW.	120	143	148	72	113	190	124	89	92	121	161	81	1	110	4	18	7	30	0	Y.

Monthly and yearly meteorological summaries—Continued.

CHARLOTTE, N. C.

[Latitude, 35° 13′ N.; longitude, 80° 51′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.196	29.89	28.47	30.0	41.4	34.4	35.3	63	-1	44.1	27.0	25	27	27	26	82	59	75	72	4.94	2.20
F ..	29.265	29.78	28.78	32.7	48.4	39.3	40.1	68	6	50.6	29.6	25	27	26	26	74	47	61	61	2.76	1.05
M .	29.151	29.45	28.63	41.5	56.3	47.6	48.5	76	24	58.8	38.8	35	35	37	36	78	50	68	66	6.39	2.17
A ..	29.222	29.52	28.75	53.3	68.1	57.8	59.7	87	32	70.6	48.7	48	54	51	51	84	62	80	75	3.88	1.70
M .	29.141	29.44	28.77	62.4	76.5	66.0	68.3	92	45	78.9	57.4	58	63	60	60	86	65	82	78	11.04	4.85
J ..	29.158	29.37	28.90	68.4	78.4	69.6	72.1	90	57	81.5	63.5	66	67	67	66	91	70	91	84	11.04	2.51
J ..	29.136	29.35	28.95	71.1	84.4	73.3	76.3	94	60	86.7	66.1	68	70	70	69	88	62	90	80	8.05	3.85
A ..	29.177	29.44	28.88	69.9	83.4	71.9	75.1	93	56	85.5	65.5	68	72	69	70	93	70	92	85	6.34	3.19
S ..	29.303	29.52	29.00	66.8	80.5	69.9	72.4	91	53	82.5	62.2	64	70	67	67	92	71	90	84	.68	.60
O ..	29.352	29.61	29.05	51.3	71.7	58.1	60.4	84	37	73.1	47.2	49	60	54	54	93	67	85	82	.34	.34
N ..	29.255	29.54	28.84	43.3	59.2	49.1	50.5	74	27	62.0	39.1	39	43	41	41	85	58	74	72	2.88	.57
D ..	29.279	29.57	28.71	33.9	45.5	37.6	39.0	62	17	47.3	31.5	29	32	31	31	81	64	78	74	6.26	2.06
Y ..	29.220	29.89	28.47	52.0	66.2	56.2	58.1	94	-1	68.5	48.0	48	52	50	50	86	62	80	76	64.60	....

CHATTANOOGA, TENN.

[Latitude, 35° 4′ N.; longitude, 85° 15′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	29.265	29.81	28.67	29.6	37.2	32.7	33.2	56	-7	41.4	25.8	26	29	30	28	89	74	88	84	6.78	3.04
F ..	29.329	29.87	28.91	32.3	46.4	37.9	38.9	65	7	49.9	28.9	27	27	29	28	82	53	74	70	3.28	1.32
M .	29.210	29.51	28.63	43.3	55.8	48.9	49.3	76	25	58.8	41.3	37	35	37	36	80	51	65	66	12.77	7.61
A ..	29.245	29.51	28.86	53.5	67.6	59.1	60.1	85	31	70.5	50.6	48	45	47	46	82	48	68	66	4.52	2.08
M .	29.189	29.43	28.82	61.4	75.4	65.3	67.4	91	47	78.5	57.7	55	55	57	56	81	53	76	70	5.63	2.66
J ..	29.180	29.34	29.02	67.8	77.3	70.2	71.8	90	59	80.7	65.4	64	64	65	64	88	66	85	80	7.84	2.13
J ..	29.178	29.35	28.99	68.9	82.2	72.3	74.5	95	58	86.2	66.7	66	64	67	66	90	56	84	77	2.85	1.07
A ..	29.209	29.43	28.94	70.2	83.5	72.9	75.5	97	62	86.1	68.1	66	67	68	67	88	58	84	77	3.96	1.22
S ..	29.321	29.51	29.10	64.3	80.0	68.6	71.0	91	48	82.3	62.5	61	63	64	62	89	57	85	77	1.11	0.51
O ..	29.393	29.61	29.05	50.2	72.0	57.0	59.7	85	37	73.4	48.6	47	48	50	48	88	43	78	70	1.28	0.91
N ..	29.320	29.65	28.82	41.3	56.4	46.2	48.0	74	27	58.7	37.9	36	37	39	37	82	52	76	70	5.42	1.84
D ..	29.342	29.60	28.84	33.0	43.5	36.8	37.8	64	12	47.1	29.2	28	31	30	30	82	64	79	75	3.09	1.05
Y ..	29.265	29.87	28.63	51.3	64.8	55.7	57.3	97	-7	67.8	48.6	47	47	48	48	85	56	78	73	58.53	....

CHEYENNE, WYO.

[Latitude, 41° 8′ N.; longitude, 104° 48′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	23.853	24.13	23.49	18.4	28.2	18.3	21.6	51	-27	32.1	8.8	14	18	11	14	81	68	75	75	.52	.22
F ..	23.934	24.30	23.45	28.5	41.0	30.7	33.4	63	9	45.3	22.0	24	28	21	24	82	66	69	72	.84	.34
M .	23.859	24.12	23.46	23.0	36.6	29.3	29.6	66	-16	41.7	19.2	18	21	21	20	80	58	72	70	1.36	.40
A ..	23.873	24.31	23.50	30.6	46.4	38.2	38.4	73	4	51.2	28.5	22	26	26	25	72	51	64	63	1.14	.32
M .	24.033	24.29	23.77	42.2	68.2	55.1	55.2	85	21	72.9	38.6	31	47	41	40	61	49	59	58	.32	.20
J ..	24.055	24.28	23.75	49.4	69.2	59.4	59.3	89	40	75.3	46.2	40	49	47	45	70	52	65	62	1.52	.46
J ..	24.101	24.26	23.94	56.9	81.2	69.4	69.2	96	46	85.2	54.0	43	45	48	45	61	33	50	48	.71	.33
A ..	24.095	24.24	23.98	56.7	77.3	64.8	66.3	92	43	80.3	54.0	50	51	55	52	78	44	72	65	1.61	.56
S ..	24.050	24.30	23.73	46.4	67.2	53.7	55.8	83	25	70.5	41.1	35	33	38	35	69	33	59	53	1.05	.46
O ..	24.029	24.39	23.63	39.6	59.5	44.3	47.8	74	22	61.6	35.2	28	27	30	28	65	32	60	52	.37	.17
N ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....
D ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....
Y ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....

CHICAGO, ILL.

[Latitude, 41° 52′ N.; longitude, 87° 38′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	29.313	29.80	28.64	19.1	23.5	21.6	21.4	48	-14	30.8	14.0	15	18	18	17	84	79	88	84	3.56	.71
F ..	29.302	29.89	28.64	24.7	31.1	28.5	28.1	56	-6	38.9	19.9	19	22	23	21	81	69	81	77	1.51	.53
M .	29.239	29.80	28.36	32.8	39.2	36.4	36.1	70	15	44.2	30.1	28	30	31	30	84	69	81	78	1.79	.54
A ..	29.330	29.73	28.62	46.6	52.7	48.0	49.1	81	23	57.3	42.1	43	45	44	44	87	76	86	83	1.29	.42
M .	29.253	29.61	28.89	53.7	60.1	57.2	57.0	82	40	65.5	48.9	46	48	48	47	77	65	74	72	1.00	.52
J ..	29.272	29.55	29.01	63.7	69.3	65.1	66.0	87	49	73.7	58.7	56	56	57	56	77	66	76	73	.94	.58
J ..	29.275	29.47	29.03	68.1	75.3	70.8	71.4	94	55	78.8	64.9	60	60	62	60	75	62	74	70	1.53	.61
A ..	29.271	29.52	28.98	68.8	76.3	72.0	72.4	92	53	78.7	66.5	62	62	63	62	79	64	75	73	3.38	1.39
S ..	29.336	29.61	29.01	61.5	71.5	65.2	66.1	86	42	73.4	58.7	55	55	57	56	80	53	76	71	6.93	2.11
O ..	29.457	29.83	28.50	51.7	61.4	56.8	56.6	79	32	64.7	49.3	44	48	48	47	76	63	74	71	1.42	.59
N ..	29.287	29.70	28.65	34.3	42.2	38.0	38.2	69	16	46.2	30.5	29	32	31	30	83	71	76	77	1.66	.74
D ..	29.427	29.91	28.80	21.6	28.6	24.8	25.0	60	-9	33.7	16.8	17	21	17	18	81	73	73	76	1.76	.37
Y ..	29.316	29.91	28.36	45.6	52.6	48.7	49.0	94	-14	57.2	41.7	40	41	42	41	80	68	78	75	26.77	....

Monthly and yearly meteorological summaries—Continued.

CHARLOTTE, N. C.
[$H = 808$. $T = 56$. $h = 47$.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.7	6.3	4.7	5.2	4,642	27	E.	NE.	13	17	11	5	4	14	11	11	7	12	9	10	0	13	6	19	0	1	0	J.
3.2	3.9	3.0	3.4	4,080	26	NW.	SW.	7	17	7	5	10	15	6	13	1	14	9	5	0	6	2	16	0	0	0	F.
6.4	6.1	4.1	5.5	5,126	28	SW.	SW.	9	16	3	0	16	28	10	8	3	9	13	9	0	11	0	7	0	2	0	M.
4.9	6.9	4.5	5.4	4,441	22	W.	SW.	6	16	12	8	10	19	9	4	6	6	16	8	0	9	0	0	0	5	0	A.
4.8	6.3	4.5	5.2	4,007	25	W.	SW.	8	9	5	3	7	35	9	16	1	6	18	7	0	9	0	0	1	10	0	M.
6.9	7.1	6.0	6.7	3,272	24	E.	SW.	9	7	17	8	12	25	3	5	4	5	11	14	0	18	0	0	0	7	0	J.
5.4	6.7	4.2	5.4	2,794	22	NE.	NE., SW.	3	20	4	11	11	20	7	11	6	8	15	8	0	14	0	0	5	16	0	J.
7.3	7.2	4.7	6.4	3,101	26	NW.	SW.	8	21	14	4	5	24	6	7	4	2	17	12	0	11	0	0	9	10	0	A.
4.5	6.7	4.2	5.1	3,262	20	SW.	NE.	8	27	13	4	5	18	6	1	8	9	13	8	0	4	0	0	3	5	0	S.
2.2	3.7	0.8	2.2	3,158	16	S.	NE.	14	28	11	3	6	10	3	13	5	22	7	2	0	1	0	0	0	1	0	O.
3.9	4.6	4.1	4.2	2,814	36	SW.	SW.	5	0	2	4	14	25	10	9	21	11	12	7	0	11	0	8	0	1	0	N.
5.8	5.6	5.1	5.5	2,601	18	NW.	NE.	9	14	9	0	10	8	4	10	29	7	15	9	0	14	1	15	0	0	0	D.
5.0	5.9	4.2	5.0	43,298	...	....	SW.	99	192	108	55	110	244	84	108	95	111	155	99	0	121	9	65	18	58	0	Y.

CHATTANOOGA, TENN.
[$H = 783$. $T = 71$. $h = 60$.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.7	6.3	6.5	6.5	4,819	26	W.	NE.	4	19	12	10	11	10	12	15	0	7	7	17	0	16	5	19	0	0	0	J.
4.6	4.8	3.7	4.4	4,681	34	NW.	N.	17	15	6	4	12	13	2	13	2	13	7	8	0	10	2	18	0	0	0	F.
7.0	6.0	5.4	6.1	5,876	30	W.	NE.	6	20	0	10	16	18	6	17	0	6	14	11	0	10	0	4	0	3	0	M.
4.6	6.1	4.3	5.0	4,631	32	W.	S., SW.	5	5	11	13	17	17	9	13	0	11	8	11	0	12	0	1	0	5	0	A.
4.0	4.9	2.5	3.8	4,356	28	NW.	SW.	6	18	3	5	10	24	10	17	0	13	15	3	0	10	0	0	1	7	0	M.
6.8	6.6	6.5	6.6	3,428	22	N.	SW.	8	15	11	15	10	20	3	8	0	4	11	15	0	18	0	0	0	5	0	J.
3.4	4.4	2.9	3.6	3,131	22	NE.	N.	19	16	8	4	11	14	9	9	3	14	14	3	0	11	0	0	5	8	0	J.
5.4	5.1	3.8	4.8	3,257	29	NE.	W.	13	16	2	8	12	16	17	7	2	10	13	8	0	10	0	0	6	7	0	A.
4.4	5.6	3.5	4.5	2,816	17	NW.	NE.	9	19	6	14	13	14	8	3	4	11	11	8	0	8	0	0	3	3	0	S.
3.1	2.7	1.2	2.3	3,370	22	SW.	NE.	18	26	13	9	6	3	5	10	3	18	10	3	0	3	0	0	0	1	0	O.
4.7	5.6	4.8	5.0	4,397	36	W.	SW.	3	5	7	10	17	20	11	15	2	12	10	8	0	12	0	7	0	0	0	N.
5.6	6.1	5.8	5.8	4,379	28	NW.	NW.	8	6	16	7	14	14	9	18	1	5	15	11	0	16	4	18	0	0	0	D.
5.0	5.4	4.2	4.9	49,141	...	....	SW.	116	180	95	109	149	183	101	145	17	124	135	106	0	136	11	67	15	39	0	Y.

CHEYENNE, WYO.
[$H = 6,105$. $T = 58$. $h = 50$.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.8	5.6	3.6	4.3	10,213	52	NW.	NW.	19	3	2	4	8	7	13	37	0	8	20	3	0	10	11	30	0	0	0	J.
2.5	5.5	2.5	3.5	9,161	46	NW.	NW.	11	2	1	1	5	4	18	40	2	16	8	4	0	7	4	22	0	0	0	F.
4.2	5.4	3.6	4.4	9,425	56	W.	NW.	20	7	3	2	12	4	16	27	2	11	15	5	0	8	4	30	0	0	0	M.
6.1	7.1	5.0	6.1	8,477	40	S.	S.	18	4	1	5	23	12	10	15	1	4	14	11	0	12	2	20	0	0	0	A.
1.9	5.0	4.5	3.8	6,269	30	W.	NW.	11	5	5	3	14	4	9	29	13	11	18	2	0	3	0	3	0	0	0	M.
3.5	5.7	4.8	4.7	5,780	29	NW.	S.	8	11	9	13	20	5	5	17	2	10	15	5	0	10	0	0	0	2	0	J.
3.2	3.6	4.6	3.8	5,445	32	S.	S.	6	6	7	13	24	3	10	12	12	12	17	2	0	8	0	0	9	3	0	J.
4.0	4.8	4.0	4.3	4,831	32	S.	NW.	9	11	2	6	19	9	4	21	12	12	13	6	0	14	0	0	2	1	0	A.
5.4	4.4	1.8	3.9	5,128	38	NW.	NW.	11	8	1	6	17	5	5	33	4	12	15	3	0	6	0	3	0	2	0	S.
4.4	3.8	2.8	3.7	6,226	40	W.	NW.	9	4	6	5	18	2	13	34	1	12	13	5	0	5	0	8	0	0	0	O.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	N.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	D.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Y.

CHICAGO, ILL.
[$H = 661$. $T = 70$. $h = 93$.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.1	7.1	6.1	6.4	7,498	28	W.	W.	6	7	8	8	14	19	21	10	0	4	15	12	1	19	17	28	0	0	0	J.
6.6	6.2	3.9	5.6	6,895	29	SW.	SW.	1	4	5	10	17	19	17	10	0	5	15	7	0	9	8	23	0	0	0	F.
6.1	5.8	5.2	5.7	6,854	20	SW., S., NW., N	NW.	15	8	8	4	14	13	12	19	0	7	11	13	0	9	3	17	0	1	0	M.
5.7	5.5	3.7	5.0	6,148	30	NW.	N., NW., SE.	17	7	7	17	8	13	4	17	0	8	13	9	0	10	0	5	0	3	0	A.
4.3	5.6	2.8	4.2	5,752	22	SE., NW	N.	18	15	11	14	6	15	4	9	1	12	14	5	0	10	0	0	0	4	0	M.
3.9	5.1	3.1	4.0	4,932	20	NW.	NE.	10	27	6	18	7	12	3	7	0	10	18	2	0	8	0	0	0	7	0	J.
3.4	3.2	1.3	2.6	5,472	23	NE.	NE.	16	24	14	11	8	8	7	5	0	18	11	2	0	6	0	0	2	4	0	J.
5.2	4.7	3.5	4.5	5,432	24	NW.	NE., E., SE.	9	17	17	17	12	8	9	4	0	8	19	4	0	11	0	0	1	5	0	A.
4.9	5.4	3.4	4.6	5,543	22	NW.	SE.	3	5	6	22	19	16	12	7	0	11	11	8	0	13	0	0	0	5	0	S.
3.9	4.9	2.6	3.8	5,568	37	SW.	S.	6	5	7	18	23	16	6	12	0	18	4	8	0	7	0	0	0	0	0	O.
5.2	5.4	5.0	5.2	6,924	32	SW.	S., W.	8	0	9	1	23	18	23	8	0	10	10	10	0	10	3	16	0	0	0	N.
5.9	5.8	5.3	5.7	5,111	27	NW.	S.	2	1	3	7	28	23	19	10	0	8	12	11	0	12	13	27	0	0	0	D.
5.1	5.4	3.8	4.8	72,129	...	....	SW.	111	120	101	147	179	180	137	118	1	119	153	91	1	124	44	116	3	29	0	Y.

Monthly and yearly meteorological summaries—Continued.

CHINCOTEAGUE, VA.

[Latitude, 37° 55′ N.; longitude, 75° 23′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J..	30.036	30.80	28.97	30.5	35.1	32.5	32.7	55	7	39.8	26.7	24	27	28	26	77	74	82	78	4.03	1.04
F..	30.085	30.55	29.31	31.1	36.6	33.1	33.6	56	2	42.0	26.7	24	27	25	26	76	69	74	73	5.11	1.54
M.	29.955	30.41	29.32	38.2	45.4	40.6	41.4	69	16	48.5	34.9	31	35	33	33	77	69	77	74	2.39	.89
A..	30.086	30.48	29.37	50.8	55.6	49.2	51.9	83	37	59.5	44.8	46	47	44	46	83	75	85	81	2.59	1.33
M.	29.922	30.36	29.47	58.3	62.6	58.0	59.6	78	44	65.8	53.2	53	54	54	54	85	75	87	82	6.18	1.59
J..	29.975	30.29	29.58	68.0	71.8	67.0	68.9	83	56	74.6	63.1	63	64	64	64	84	77	92	84	2.47	0.94
J..	29.945	30.19	29.72	73.2	77.9	72.3	74.5	88	63	80.1	68.0	69	69	69	69	88	75	91	84	4.62	1.14
A..	29.977	30.32	29.64	71.7	75.8	72.1	73.2	87	59	78.2	67.6	67	67	67	67	87	76	84	82	6.71	2.07
S..	30.124	30.36	29.72	69.6	74.1	69.4	71.0	85	57	76.3	65.1	64	64	64	64	83	72	84	80	1.03	0.59
O..	30.162	30.49	29.82	58.3	65.0	59.8	61.0	79	43	67.6	54.6	54	54	54	54	86	69	81	78	1.91	1.39
N..	30.056	30.44	29.50	47.3	54.1	48.6	50.0	66	30	57.2	42.2	39	40	40	40	74	61	72	69	3.65	1.33
D..	30.118	30.54	29.51	33.7	39.8	35.7	36.4	59	10	44.8	29.9	28	32	31	30	80	75	82	79	4.54	1.22
Y..	30.037	30.80	28.97	52.6	57.8	53.2	54.5	88	2	61.2	48.1	46	48	48	48	82	72	83	79	45.23	....

CINCINNATI, OHIO.

[Latitude, 39° 6′ N.; longitude, 84° 30′ W.]

J..	29.380	29.94	28.72	22.3	28.7	25.1	25.4	57	-12	33.4	18.4	18	20	20	19	84	69	81	78	2.83	.99
F..	29.452	30.02	28.85	25.5	35.0	29.8	30.1	63	-1	38.6	21.6	20	22	22	21	81	58	72	70	1.65	.55
M.	29.312	29.77	28.57	36.3	46.9	41.2	41.5	75	17	51.7	34.1	30	29	32	30	79	53	70	68	2.27	.70
A..	29.380	29.69	28.95	48.9	62.4	54.5	55.3	83	25	64.7	46.9	42	41	44	42	78	49	70	66	2.23	.58
M.	29.296	29.66	28.98	58.7	72.3	64.7	65.2	86	44	75.1	56.2	53	52	56	54	80	51	74	68	4.11	1.28
J..	29.316	29.54	29.06	65.0	75.6	68.6	69.7	85	51	78.5	62.3	59	58	62	60	82	57	80	73	5.26	1.68
J..	29.301	29.50	29.11	67.6	82.3	73.6	74.5	95	60	85.1	65.4	62	60	66	63	84	49	77	70	3.07	.88
A..	29.335	29.58	29.08	67.9	81.4	72.5	73.9	91	57	83.2	65.9	63	62	65	64	85	54	77	72	2.91	1.17
S..	29.448	29.70	29.19	61.7	76.5	67.0	68.4	88	44	79.0	59.3	58	60	61	60	89	60	80	76	1.30	0.36
O..	29.544	29.81	28.87	47.7	65.9	55.1	56.2	83	32	68.1	45.7	44	47	47	46	88	52	76	72	0.82	0.42
N..	29.396	29.78	28.78	37.2	46.5	41.2	41.6	73	18	50.2	33.2	32	35	34	33	81	67	75	74	3.23	1.39
D..	29.486	29.82	28.92	24.8	32.7	28.7	28.7	60	-3	36.1	19.4	19	22	23	21	79	68	78	75	1.67	.71
Y..	29,387	30.02	28.57	47.0	58.8	51.8	52.5	95	-12	62.0	44.0	42	42	44	43	82	57	76	72	31.35	....

CLEVELAND, OHIO.

[Latitude, 41° 30′ N.; Longitude, 81° 42′ W.]

J..	29.262	29.89	28.53	21.6	25.3	22.4	23.1	54	-9	30.6	16.5	18	20	18	19	84	80	85	83	3.35	.94
F..	29.313	29.89	28.58	22.3	28.8	25.1	25.4	55	-7	34.1	16.3	18	21	20	20	83	74	81	80	1.55	.47
M.	29.194	29.65	28.43	31.8	38.4	34.6	34.9	74	7	43.4	27.7	27	30	29	29	82	74	81	79	2.00	.71
A..	29.311	29.66	28.68	44.7	53.3	49.4	49.1	82	24	58.2	41.3	40	42	42	41	83	68	77	76	1.78	.74
M.	29.205	29.59	28.73	54.8	60.5	57.0	57.4	80	36	66.2	49.7	50	52	51	51	83	75	82	80	1.68	.64
J..	29.234	29.48	28.86	61.8	70.3	64.4	65.5	90	44	73.6	56.5	56	58	58	57	81	66	79	75	1.01	.49
J..	29.223	29.44	28.99	65.5	74.3	70.0	69.9	92	51	78.2	60.6	58	61	59	60	78	65	69	71	2.64	1.84
A..	29.251	29.51	28.97	65.1	75.2	68.1	69.5	89	51	77.8	61.5	59	61	60	60	80	63	76	73	1.36	.53
S..	29.343	29.64	28.97	59.9	70.6	64.0	64.8	87	42	74.2	56.2	53	56	53	54	80	61	68	60	4.04	1.49
O..	29.432	29.71	28.66	48.1	60.4	53.3	53.9	80	35	63.7	44.7	41	45	44	43	78	59	72	70	.47	.29
N..	29.252	29.64	28.51	36.0	42.6	38.1	38.9	71	20	45.8	31.5	27	30	29	29	71	63	72	69	3.89	1.39
D..	29.357	29.81	28.73	22.7	28.9	24.4	25.3	53	zero	32.4	16.4	17	20	19	18	78	70	80	76	3.57	.91
Y..	29.281	29.89	28.43	44.5	52.4	47.6	48.2	92	9	56.5	39.9	38	41	40	40	80	68	77	75	27.34	....

COLUMBUS, OHIO.

[Latitude, 39° 58′ N.; Longitude, 83° 0′ W.]

J..	29,161	29.78	28.43	21.3	27.2	22.9	23.8	56	-11	31.0	15.9	17	20	18	18	81	76	80	79	4.36	1.41
F..	29.229	29.78	28.61	23.0	32.5	26.9	27.5	61	-5	35.5	18.2	15	22	20	19	73	66	76	72	1.26	0.48
M.	29.100	29.50	28.40	34.0	43.5	38.4	38.6	73	10	47.7	30.2	28	35	32	32	78	72	78	76	3.90	1.10
A..	29.189	29.53	28.60	47.7	61.9	53.6	54.4	82	23	63.8	45.6	40	45	45	43	76	57	74	69	3.57	0.78
M.	29.097	29.48	28.75	55.8	71.2	61.6	62.9	85	41	73.2	52.3	50	57	54	53	81	62	76	73	7.67	2.23
J..	29.118	29.33	28.84	62.0	74.7	66.2	76.6	87	44	77.4	57.2	56	63	61	60	82	68	85	78	2.69	0.75
J..	29.108	29.32	28.89	65.1	81.4	70.7	72.4	93	55	83.5	61.0	62	70	65	65	90	68	83	80	4.17	3.19
A..	29.140	29.40	28.87	64.7	80.2	69.6	71.5	91	51	81.8	61.4	60	64	62	62	86	58	77	73	2.44	1.44
S..	29.242	29.52	28.95	58.8	74.5	63.9	65.7	89	40	77.1	54.6	54	58	56	56	86	58	76	73	3.61	1.61
O..	29.328	29.60	28.72	46.0	64.2	52.8	54.3	81	32	65.8	42.9	42	42	42	42	84	46	69	66	1.13	0.65
N..	29.166	29.50	28.51	34.6	44.1	38.0	38.9	68	18	47.3	30.2	28	30	29	29	77	62	71	70	4.18	1.67
D..	29.259	29.63	28.70	22.4	31.2	26.5	26.7	59	1	36.1	18.3	16	18	20	18	76	61	77	71	3.41	0.98
Y..	29.178	29.78	28.40	44.6	57.2	49.3	50.4	93	-11	60.0	40.6	39	44	42	42	81	63	77	73	42.39	....

Monthly and yearly meteorological summaries—Continued.

CHINCOTEAGUE, VA.

[$H=8.$ $T=32.$ $h=1.$]

Cloudiness (in tenths.)				Wind.													Number of days—										Months and year.
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
5.2	5.2	4.8	5.1	11,228	40	W., NW.	NW.	13	15	5	9	4	4	14	29	0	7	18	6	1	15	5	22	0	0	0	J.
3.5	3.8	2.4	3.2	10,784	61	NW.	NW.	4	4	6	7	15	13	5	29	1	13	13	2	3	7	2	17	0	0	2	F.
3.9	5.0	3.2	4.0	11,570	51	NW.	NW.	6	7	8	12	15	9	10	26	0	11	15	5	0	11	2	10	0	0	0	M.
4.9	4.9	3.8	4.5	8,265	30	NE.	NE.	4	31	12	10	11	12	5	5	0	8	17	5	2	12	0	0	0	1	0	A.
5.2	4.5	3.9	4.5	9,685	50	NE.	S.	11	13	4	18	26	7	2	12	0	11	12	8	0	15	0	0	0	2	0	M.
5.8	5.6	5.0	5.5	6,542	32	NE.	SE.	5	14	17	26	9	9	6	3	1	7	14	9	0	15	0	0	0	2	0	J.
5.0	4.9	4.4	4.8	5,772	36	N.	S.	8	4	16	18	32	6	5	3	1	9	16	6	0	15	0	0	0	9	0	J.
5.1	5.4	4.0	4.8	6,906	37	NE.	S.	3	19	11	15	20	9	7	9	0	8	17	6	0	10	0	0	0	0	0	A.
4.0	4.3	3.5	3.9	7,129	31	NW.	NE., SE.	8	19	9	19	16	5	3	10	1	10	15	5	0	7	0	0	0	0	0	S.
4.0	3.3	1.8	3.0	7,615	34	NW.	NW.	12	14	8	14	9	9	7	20	0	17	12	2	0	5	0	0	0	1	0	O.
4.0	4.2	4.3	4.2	8,768	46	W.	S.	5	4	9	7	26	9	17	13	0	14	8	8	0	10	0	3	0	2	0	N.
4.7	5.2	4.3	4.7	10,541	52	NW.	NW.	16	16	2	2	15	16	9	17	0	9	16	6	0	16	2	19	0	0	0	D.
4.6	4.7	3.8	4.4	104,805	..	....	S.	95	160	107	157	198	108	90	176	4	124	173	68	6	138	11	71	0	18	2	Y.

CINCINNATI, OHIO.

[$H=628.$ $T=153.$ $h=149.$]

Cloudiness (in tenths.)				Wind.													Number of days—										Months and year.
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
7.7	7.9	6.5	7.4	6,055	31	W.	NW.	3	9	8	18	2	12	11	22	8	3	10	18	0	21	14	25	0	0	0	J.
4.9	6.3	4.9	5.4	5,765	34	NW.	NW.	2	9	2	11	9	18	4	23	6	7	12	9	0	9	10	21	0	0	0	F.
5.5	5.5	5.7	5.6	7,187	30	SW.	SW.	15	14	4	12	5	21	6	14	2	7	14	10	0	13	2	17	0	0	0	M.
4.9	6.1	4.1	5.0	5,343	29	SW.	SE.	9	16	5	24	7	12	2	8	7	11	11	8	0	12	0	8	0	1	0	A.
4.9	5.1	3.8	4.6	4,928	30	W.	SW.	12	13	5	10	9	19	6	13	6	11	16	4	0	11	0	0	0	7	0	M.
5.5	6.0	4.2	5.2	4,158	28	NW.	SE.	3	16	8	24	3	8	9	8	11	7	17	6	0	14	0	0	0	6	0	J.
3.0	3.7	2.5	3.1	3,739	33	NE.	SE.	13	15	11	16	6	5	6	6	15	16	12	3	0	7	0	0	3	6	0	J.
4.9	4.4	4.0	4.4	3,972	44	NE.	E., SE.	9	12	15	15	7	14	9	3	9	12	14	5	0	13	0	0	1	8	0	A.
4.3	5.4	2.8	4.2	4,279	32	SW., NE.	SE.	7	5	3	27	10	20	5	4	9	12	13	5	0	8	0	0	0	2	0	S.
3.9	2.7	2.6	3.1	4,275	40	W.	SE.	12	7	3	29	6	8	8	9	11	18	9	4	0	5	0	0	0	0	0	O.
5.8	6.6	5.7	6.0	6,367	36	SW.	W.	11	6	4	16	5	18	21	6	3	5	15	10	0	11	0	14	0	0	0	N.
5.5	5.5	5.5	5.5	6,114	30	W., N.	SW.	12	12	8	18	2	19	11	9	2	9	11	11	0	13	10	27	0	0	0	D.
5.1	5.4	4.4	5.0	62,182	..	....	SE.	108	134	76	220	71	174	98	125	89	118	154	93	0	137	36	112	4	30	0	Y.

CLEVELAND, OHIO.

[$H=690.$ $T=82.$ $h=74.$]

Cloudiness (in tenths.)				Wind.													Number of days—										Months and year.
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
7.5	8.1	6.9	7.5	8,407	34	SE.	W.	9	9	4	12	20	6	24	9	0	3	12	16	0	17	14	26	0	0	0	J.
7.0	6.8	5.2	6.3	8,447	28	SW., W.	S.	8	6	0	11	22	15	11	11	0	2	17	9	0	12	13	23	0	0	0	F.
5.6	6.7	5.0	5.8	7,535	30	SW., S.	W.	11	10	5	8	14	11	19	13	2	6	16	9	0	14	6	20	0	0	0	M.
5.4	5.2	3.8	4.8	6,697	44	SW.	NE.	9	27	4	14	19	4	7	4	2	11	11	8	0	10	1	9	0	1	0	A.
5.0	4.7	3.7	4.5	5,433	24	SW., NE., S.	N.	17	16	4	13	12	11	8	10	2	11	14	6	0	10	0	0	0	5	1	M.
5.1	4.9	2.6	4.2	4,847	22	NW., N.	N.	18	13	10	13	12	6	7	10	1	13	11	6	0	8	0	0	1	3	0	J.
3.6	4.3	3.1	3.7	4,608	20	S.	NE.	23	25	6	14	13	3	3	4	2	16	12	3	0	9	0	0	1	3	0	J.
5.2	4.6	3.5	4.4	5,575	32	W.	NE.	13	16	11	15	14	8	3	12	1	13	11	7	0	10	0	0	0	3	0	A.
4.1	5.5	2.9	4.2	6,461	32	W.	SE.	9	9	1	25	20	9	9	8	0	12	14	4	0	9	0	0	0	3	0	S.
5.5	5.2	3.3	4.7	6,621	44	SW.	S.	11	8	9	18	19	10	9	9	0	11	11	9	0	7	0	0	0	1	0	O.
6.9	7.0	6.0	6.6	8,365	40	SW.	SW.	1	6	4	9	16	26	16	12	0	5	12	13	0	13	2	19	0	0	0	N.
6.3	6.8	5.5	6.2	7,183	31	W.	SW.	5	4	12	7	18	22	13	11	1	7	10	14	0	17	15	29	0	0	0	D.
5.6	5.8	4.3	5.2	80,179	..	....	S.	134	149	70	159	199	131	129	113	11	110	151	104	0	136	51	126	2	19	1	Y.

COLUMBUS, OHIO.

[$H=812.$ $T=81.$ $h=70.$]

Cloudiness (in tenths.)				Wind.													Number of days—										Months and year.
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
8.5	8.2	6.3	7.7	6,042	34	W.	W.	6	6	10	15	16	6	17	15	2	3	10	18	0	18	14	27	0	0	0	J.
4.5	7.7	5.6	5.8	5,589	32	W.	SW.	6	7	5	5	10	21	15	11	4	7	10	11	0	5	12	22	0	0	0	F.
6.4	7.1	5.7	6.4	7,048	32	W.	SW., W.	13	13	3	8	12	15	15	13	1	2	19	10	0	16	2	20	0	0	0	M.
4.7	6.2	4.7	5.2	5,451	28	SW.	SE., SW.	14	8	7	17	10	17	10	7	0	11	10	9	0	14	0	8	0	3	0	A.
5.0	5.4	3.3	4.6	4,840	28	SW.	NW.	12	14	2	8	8	11	13	20	5	12	13	6	0	12	0	0	0	10	0	M.
4.8	5.9	3.0	4.6	3,682	22	W.	NE., SE., NW.	11	14	7	14	10	10	8	14	2	11	12	7	0	13	0	0	0	2	0	J.
4.1	5.6	3.9	4.5	3,572	30	NW.	NE.	6	20	10	11	8	18	8	12	0	10	14	7	0	10	0	0	4	8	1	J.
5.1	6.4	2.7	4.7	3,955	34	NW.	SW.	13	10	6	11	11	17	11	10	4	10	16	5	0	9	0	0	1	6	0	A.
4.4	6.6	2.4	4.5	4,359	29	W	S.	7	0	10	17	18	11	14	9	4	10	18	2	0	10	0	0	0	3	0	S.
4.2	3.9	3.0	3.7	4,047	45	SW.	SW.	8	2	3	7	12	21	13	16	11	16	9	6	0	5	0	0	0	0	0	O.
5.4	5.9	5.1	5.5	6,652	40	SW.	SW.	7	2	5	7	16	28	19	6	0	7	13	10	0	15	0	17	0	0	0	N.
5.0	6.3	5.4	5.6	5,968	40	W.	S.	16	11	3	5	19	17	15	7	0	10	10	11	0	16	10	29	0	0	0	D.
5.2	6.2	4.3	5.2	61,205	..	....	SW.	119	107	71	125	150	192	158	140	33	109	154	102	0	143	38	123	5	32	1	Y.

Monthly and yearly meteorological summaries—Continued.

CONCORDIA, KANS.

[Latitude, 39° 35′ N.; longitude, 97° 41′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J...	28.638	29.12	28.18	6.0	14.7	10.7	10.5	42	-22	20.0	2.2	4	11	9	8	93	86	92	90	0.62	0.35
F..	28.586	29.10	27.97	24.8	37.3	30.1	30.7	62	-10	41.9	21.2	22	29	25	25	88	74	84	82	0.88	0.39
M .	28.504	28.89	27.99	28.8	40.8	35.3	35.0	70	6	45.1	26.2	26	30	30	29	90	70	83	81	2.56	0.83
A..	28.478	28.94	28.01	43.4	59.8	49.7	51.0	83	18	63.0	40.5	39	39	41	40	85	52	73	70	3.39	1.51
M .	28.470	28.76	28.03	56.6	76.4	65.7	66.2	93	40	79.7	54.3	53	57	57	56	89	52	75	72	4.65	1.46
J...	28.511	28.90	28.18	61.8	79.3	68.6	69.9	96	46	82.6	60.2	59	60	61	60	90	54	76	73	3.20	1.82
J...	28.500	28.67	28.31	67.2	87.1	75.5	76.6	100	58	90.6	65.4	63	66	66	65	88	52	74	71	3.49	2.44
A..	28.493	28.68	28.26	66.4	86.4	74.8	75.9	99	50	88.9	65.2	62	68	66	65	85	54	76	72	2.46	1.12
S...	28.534	28.86	28.10	60.9	78.0	67.2	68.7	93	39	81.0	57.9	53	60	58	57	76	56	73	69	3.89	1.26
O..	28.631	29.13	28.11	50.4	70.2	58.6	59.7	87	25	72.8	47.2	40	52	46	46	70	55	64	63	1.25	0.75
N..	28.567	29.00	27.97	30.2	46.8	34.8	37.3	71	2	49.7	25.7	20	28	22	24	67	51	61	60	1.29	1.05
D .	28.677	29.24	28.26	18.8	30.4	23.3	24.2	59	- 7	34.7	15.2	15	18	17	17	84	64	78	76	0.56	0.40
Y..	28.549	29.24	27.97	42.9	58.9	49.5	50.4	100	-22	62.5	40.1	38	43	42	41	84	60	76	73	28.24	...

DAVENPORT, IOWA.

[Latitude, 41° 30′ N.; longitude, 90° 38′ W.]

J...	29.411	29.89	28.76	10.0	16.3	13.5	13.3	49	-21	21.0	6.3	6	8	9	8	83	70	82	78	2.22	0.77
F..	29.405	29.96	28.79	18.2	27.6	23.5	23.1	49	-18	32.7	15.3	13	17	18	16	80	64	78	74	1.52	0.50
M .	29.305	29.91	28.57	28.0	38.0	33.1	33.0	68	4	41.1	25.6	23	26	26	25	81	64	77	74	3.08	1.42
A..	29.345	29.72	28.88	45.9	58.7	51.3	52.0	81	14	61.8	43.4	40	41	42	41	79	55	73	69	1.84	0.64
M	29.296	29.65	28.89	56.4	70.1	60.8	62.4	85	39	73.0	53.0	50	52	54	52	78	56	78	70	3.73	1.45
J...	29.311	29.64	29.05	64.2	79.0	67.5	70.2	90	44	81.1	59.3	56	56	58	57	76	47	73	65	0.49	0.26
J...	29.308	29.51	29.07	67.5	86.4	75.0	76.3	98	54	88.7	65.0	59	60	62	60	75	42	65	61	0.43	0.43
A..	29.301	29.52	29.03	67.2	83.3	72.7	74.4	96	49	85.6	65.1	62	61	62	61	83	48	69	67	2.67	0.94
S..	29.363	29.64	29.05	59.4	73.1	64.1	65.5	89	38	75.5	57.0	53	52	55	53	81	50	72	68	2.43	1.06
O..	29.491	29.90	28.47	48.2	64.2	54.7	55.7	83	29	67.3	46.0	42	43	44	43	78	48	69	65	3.47	2.29
N .	29.347	29.78	28.64	30.3	40.8	34.1	35.1	71	11	46.6	27.4	23	23	24	24	76	53	69	66	0.74	0.21
D.	29.503	29.99	28.96	13.1	22.8	16.6	17.5	54	-22	29.9	8.8	9	14	12	12	82	71	81	78	0.53	0.17
Y..	29.365	29.99	28.47	42.4	55.0	47.2	48.2	98	-22	58.7	39.3	36	38	39	38	79	56	74	70	23.15	....

DEADWOOD, DAK.

[Latitude, 44° 23′ N.; longitude, 103° 43′ W.]

J...	25.276	25.58	24.76	12.2	19.0	13.0	14.7	49	-24	24.8	5.0	7	11	8	9	81	72	81	78	1.28	0.44
F..	25.303	25.65	24.87	27.4	36.2	29.5	31.0	59	- 3	40.1	22.4	21	24	23	23	77	63	78	73	1.78	0.62
M..	25.268	25.54	24.75	25.5	34.2	28.9	29.6	60	6	37.1	21.6	20	24	23	22	81	67	79	76	2.12	0.48
A..	25.267	25.77	24.82	36.0	47.1	40.7	41.3	69	15	49.9	34.3	30	34	34	33	79	63	77	73	6.72	3.37
M	25.390	25.63	25.05	47.6	62.5	54.0	54.7	86	26	65.4	44.9	38	41	42	41	72	48	66	62	1.01	0.68
J...	25.434	25.70	25.17	52.8	67.4	58.5	59.6	82	40	69.7	50.2	44	47	48	47	73	50	68	64	2.00	0.53
J...	25.459	25.64	25.23	63.2	79.5	70.0	70.9	96	48	82.9	61.2	53	57	57	56	70	49	64	61	2.45	0.69
A..	25.440	25.65	25.29	59.6	75.7	65.0	66.8	93	38	78.1	57.4	51	54	54	53	74	50	68	64	1.84	0.98
S..	25.408	25.70	25.09	47.0	62.0	52.0	53.7	83	35	65.3	44.8	38	44	42	41	72	54	68	65	1.06	0.71
O..	25.399	25.84	25.03	42.1	55.1	45.8	47.7	78	25	58.2	39.5	34	39	36	37	75	58	70	68	0.96	0.49
N..	25.353	25.68	24.85	27.1	33.2	27.5	29.3	53	- 5	37.8	21.4	21	23	21	22	78	68	75	74	3.24	0.52
D..	25.321	25.69	25.02	22.8	29.1	22.4	24.8	51	-15	34.0	15.5	18	23	18	19	82	78	81	80	1.51	0.38
Y..	25.360	25.84	24.75	38.6	50.1	42.3	43.7	96	-24	53.6	34.8	31	35	34	34	76	60	73	70	25.97	...

DENVER, COLO.

[Latitude, 39° 45′ N.; longitude, 105° 00′ W.]

J...	24.654	24.92	24.27	15.1	27.3	20.1	20.8	63	-19	35.0	8.8	6	14	11	10	70	60	70	67	0.62	0.29
F..	24.714	25.13	24.20	30.6	48.0	37.1	38.6	71	3	52.2	26.0	19	16	21	19	65	34	56	52	0.72	0.34
M .	24.637	24.92	24.15	26.7	41.1	32.7	33.5	68	-11	46.3	22.6	20	18	22	20	79	48	69	65	2.36	0.66
A..	24.628	25.08	24.16	36.3	52.3	44.1	44.2	75	20	56.5	34.6	27	25	31	28	76	42	64	61	2.79	0.89
M.	24.774	25.04	24.46	47.3	74.3	61.3	61.0	90	36	77.7	46.1	32	25	34	30	56	18	38	37	0.09	0.03
J...	24.794	25.05	24.42	51.6	75.1	66.1	65.3	93	47	78.8	52.7	47	43	48	46	75	35	54	55	2.26	1.55
J...	24.833	25.01	24.66	62.2	85.2	74.2	73.9	90	56	88.2	60.3	49	47	51	49	66	31	48	48	0.50	0.26
A..	24.829	25.01	24.72	60.6	81.5	70.8	71.0	94	48	85.2	58.3	52	49	54	52	75	35	58	56	1.62	1.13
S..	24.793	25.09	24.46	48.8	72.0	60.5	60.4	86	29	75.1	45.6	39	37	42	40	72	33	54	53	0.98	0.81
O..	24.784	25.19	24.32	41.9	64.2	51.4	52.5	77	23	66.8	37.0	31	31	33	32	68	31	52	50	0.33	0.28
N..	24.740	25.05	24.15	27.5	41.3	30.8	33.2	63	- 6	45.5	20.4	18	20	19	19	72	48	63	61	1.93	0.90
D..	24.725	25.05	24.44	32.7	45.5	33.0	37.1	65	1	49.6	21.1	19	19	20	19	60	40	61	53	0.87	0.42
Y..	24.742	25.19	24.15	40.4	59.0	48.5	49.3	96	-19	63.1	36.1	30	29	32	30	69	38	57	55	15.07	....

Monthly and yearly meteorological summaries—Continued.

CONCORDIA, KANS.

[$H = 1,384.$ $T = 42.$ $h = 34.$]

Cloudiness (in tenths.)				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles.)	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.0	5.5	4.3	4.9	7,880	38	N.	N.	38	10	5	13	8	5	1	10	3	10	12	9	0	7	24	31	0	0	0	J..
3.8	4.4	3.9	4.0	6,761	37	S.	N.	22	9	4	9	13	12	4	11	0	14	7	7	0	5	5	23	0	0	0	F.
5.8	5.7	3.8	5.1	7,551	34	S.	NW.	20	11	14	5	10	2	9	21	1	10	13	8	0	9	3	22	0	0	0	M.
5.0	5.2	3.1	4.4	8,359	44	S.	SE.	15	12	9	19	14	6	5	8	2	11	12	7	0	11	2	7	0	6	0	A.
3.2	3.3	2.7	3.1	6,163	32	N., S.	E.	16	15	18	10	13	6	4	7	4	16	13	2	0	10	0	0	3	7	0	M.
4.2	4.9	2.7	3.9	5,388	30	SW.	S.	13	17	8	15	18	5	2	5	7	11	19	0	0	10	0	0	2	4	0	J..
3.4	2.8	2.5	2.9	4,686	24	S.,SE.	S.	5	21	17	14	23	3	2	2	6	18	9	4	0	7	0	0	16	5	0	J.
3.7	3.0	2.5	3.1	5,157	24	N., S.	S.	11	9	8	15	23	11	2	6	8	16	13	2	0	7	0	0	14	3	0	A.
3.5	3.5	3.3	3.4	6,218	29	N.	S.	13	6	4	4	34	10	6	2	11	17	9	4	0	9	0	0	5	0	0	S..
3.9	4.2	1.8	3.3	6,392	36	S.	S.	7	5	3	9	41	8	3	4	13	14	14	3	0	3	0	3	0	0	0	O.
3.9	3.8	2.4	3.4	6,640	36	N.	NW.	11	3	7	2	15	8	12	23	9	14	11	5	0	5	2	23	0	0	0	N.
2.9	5.5	3.4	3.9	5,853	36	NW.	N.	22	12	8	8	17	6	4	10	6	15	11	5	0	4	14	28	0	0	0	D.
4.0	4.3	3.0	3.8	77,048	...	....	S.	193	130	105	123	229	82	54	109	70	166	143	56	0	87	50	137	40	25	0	Y.

DAVENPORT, IOWA.

[$H = 615.$ $T = 73.$ $h = 77.$]

Cloudiness (in tenths.)				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles.)	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.3	7.2	6.2	6.6	6,805	26	NW.	NW.	9	16	8	7	9	9	16	19	0	5	13	13	0	17	24	28	0	0	0	J.
5.7	6.9	4.2	5.6	6,910	32	NW.	NW.	9	1	5	6	11	15	13	24	0	9	10	9	0	7	11	24	0	0	0	F.
6.2	6.7	5.1	6.0	6,331	27	S.	NW.	8	21	9	4	7	9	8	26	1	9	10	12	0	12	4	24	0	3	0	M.
6.3	7.6	3.1	5.7	6,652	39	SE.	SE.	11	15	11	19	14	8	4	8	0	4	18	8	0	8	1	7	0	4	0	A.
5.0	6.1	2.4	4.5	4,503	36	S.	SW.	13	14	8	11	8	17	6	13	3	11	16	4	0	10	0	0	0	5	0	M.
3.1	6.4	2.6	4.0	4,470	24	NW.	NW.	8	7	15	10	7	14	5	21	3	13	15	2	0	8	0	0	0	4	0	J.
3.2	3.7	0.7	2.5	4,592	27	NW.	NE.	16	21	10	11	11	12	5	7	0	17	13	1	0	1	0	0	13	1	0	J.
4.8	5.6	3.2	4.5	4,582	32	SW.	E.	11	5	19	6	11	17	3	9	12	13	8	10	0	9	0	0	8	6	0	A.
5.3	6.3	4.5	5.4	5,520	34	NW.	S.	3	3	3	11	21	19	7	16	7	7	14	9	0	14	0	0	0	6	0	S.
4.5	4.0	2.2	3.6	5,416	38	SW.	S.	7	8	4	7	25	13	9	11	9	15	12	4	0	4	0	1	0	1	0	O.
5.7	5.9	4.4	5.3	6,721	34	SW.	SW.	9	6	9	2	10	19	18	16	1	9	13	8	0	8	4	22	0	0	0	N.
4.3	5.4	2.8	4.2	5,276	24	SW., S.	NW.	13	8	6	5	10	14	5	29	3	12	15	4	0	8	18	28	0	0	0	D.
5.0	6.0	3.4	4.8	67,778	...	....	NW.	117	125	107	99	144	166	99	199	39	124	157	84	0	106	62	134	21	30	0	Y.

DEADWOOD, DAK.

[$H = 4,600.$ $T = 24.$ $h = 52.$]

Cloudiness (in tenths.)				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles.)	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.4	3.9	3.2	3.5	2,537	33	SW.	NE.	7	42	1	1	11	23	0	0	8	14	14	3	0	14	17	29	0	0	0	J.
3.4	5.5	3.6	4.2	2,288	21	SW.	SW.	6	22	1	3	6	39	2	2	3	13	11	4	0	14	7	22	0	0	0	F.
5.2	5.9	3.6	4.9	2,367	26	SW.	NE.	4	36	6	3	6	23	1	1	13	9	14	8	0	16	8	28	0	0	0	M.
4.2	6.2	4.7	5.0	2,729	26	SW.	SW.	0	25	1	2	8	32	0	0	22	8	15	7	0	16	2	8	0	0	0	A.
2.7	4.6	3.5	3.2	2,186	16	SW., N.	SW.	7	16	2	0	4	29	3	1	31	12	16	3	0	8	0	1	0	3	0	M.
2.4	4.8	2.7	3.3	1,839	17	NE.	SW.	5	16	1	1	6	20	4	4	33	18	10	2	0	13	0	0	0	3	0	J.
2.5	3.4	3.9	3.3	2,523	23	SW.	SW.	5	7	2	4	15	43	2	1	14	17	9	5	0	9	0	0	8	2	0	J.
1.6	2.9	1.6	2.0	1,735	17	S.	SW.	5	16	1	4	10	21	1	2	33	21	10	0	0	5	0	0	4	0	0	A.
2.5	3.5	1.7	2.6	1,610	18	S.	SW.	4	18	0	1	5	22	4	3	33	19	9	2	0	5	0	0	0	0	0	S.
2.5	3.3	2.9	2.9	2,627	21	SW.	NE.	7	28	3	4	6	19	3	2	21	19	8	4	0	7	0	4	0	0	0	O.
4.9	5.0	3.3	4.4	3,822	14	SW. N., S.	SW.	2	35	1	1	4	42	2	2	1	12	12	6	0	13	7	23	0	0	0	N.
3.5	5.7	3.1	4.1	3,544	23	SW.	SW.,NE	4	36	1	0	7	36	5	3	1	9	20	2	0	13	10	29	0	0	0	D.
3.2	4.6	3.2	3.6	29,807	...	....	SW.	56	297	20	24	88	349	27	21	213	171	148	46	0	133	51	144	12	8	0	Y.

DENVER, COLO.

[$H = 5,294.$ $T = 105.$ $h = 86.$]

Cloudiness (in tenths.)				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles.)	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
2.5	5.1	2.9	3.5	5,796	42	W.	S.	14	9	3	7	38	7	10	5	0	14	15	2	0	8	9	29	0	0	0	J.
3.3	5.3	2.9	3.8	6,753	42	N.	S.	16	7	4	5	26	5	10	11	0	11	12	5	0	4	1	21	0	0	0	F.
4.5	5.3	3.7	4.5	5,983	43	N.	S.	20	13	5	1	29	12	7	6	0	11	16	4	0	11	4	28	0	0	0	M.
6.3	6.7	5.8	6.3	6,262	32	N.	N.	27	7	7	1	18	9	9	11	1	5	12	13	0	16	0	9	0	2	0	A.
2.6	4.9	2.1	3.2	5,600	39	NW.	S.	10	15	6	5	31	14	5	7	0	16	15	0	0	4	0	0	0	2	0	M.
2.7	4.9	4.5	4.0	4,990	40	NW.	N.	29	8	9	6	21	8	5	4	0	9	18	3	0	11	0	0	1	10	0	J.
3.0	4.3	3.7	3.7	5,120	32	S.	S.	18	12	7	3	35	8	3	7	0	16	11	4	0	5	0	0	13	4	0	J.
3.5	5.1	4.0	4.2	4,918	34	N.	S.	25	5	8	1	36	10	1	7	0	11	18	2	0	10	0	0	10	8	0	A.
2.7	4.1	1.3	2.7	4,658	36	N.	S.	23	9	4	4	34	7	4	5	0	18	11	1	0	4	0	2	0	1	0	S.
3.2	4.1	1.9	3.1	5,182	32	S.	S.	22	7	3	7	38	5	4	7	0	16	13	2	0	4	0	8	0	0	0	O.
2.6	4.5	2.8	3.3	6,683	38	W.	S.	22	5	4	0	33	6	7	13	0	15	11	4	0	6	5	24	0	0	0	N.
2.2	4.1	2.2	2.8	6,610	36	W., NW	S.	11	7	5	5	28	8	17	12	0	16	15	0	0	6	1	28	0	0	0	D.
3.3	4.9	3.2	3.8	68,555	...	....	S.	237	104	65	45	367	99	82	95	1	158	167	40	0	89	20	149	24	27	0	Y.

Monthly and yearly meteorological summaries—Continued.

DES MOINES, IOWA.

[Latitude 41° 35′ N.; longitude 93° 37′ W.]

Months and years.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	11 p.m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a.m.	3 p.m.	11 p.m.	Mean.	7 a.m.	3 p.m.	11 p.m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J..	23.195	29.69	28.55	7.3	14.2	11.2	10.9	37	-24	18.3	3.5	3	7	6	5	81	71	80	78	3.47	0.93
F..	29.151	29.76	28.57	19.1	29.8	25.3	24.7	52	-20	33.4	16.1	15	21	20	19	82	70	81	78	0.52	0.21
M..	29.073	29.64	28.54	29.6	40.9	34.2	34.9	70	8	43.5	27.8	25	30	29	28	84	67	82	78	1.41	0.46
A..	29.078	29.46	28.55	46.3	59.3	52.5	52.7	84	21	63.3	44.5	41	44	46	44	83	58	78	73	4.32	1.20
M	29.055	29.39	28.51	56.6	72.8	63.7	64.4	94	37	77.3	54.6	52	54	55	54	85	52	74	70	4.01	1.55
J..	29.085	29.44	28.80	63.1	81.0	69.9	71.3	101	45	85.2	60.6	58	59	61	59	84	48	74	69	1.21	0.57
J..	29.075	29.26	28.86	68.7	89.8	76.8	78.4	104	57	93.6	66.8	61	61	64	62	77	40	66	61	0.27	0.15
A..	29.056	29.24	28.80	68.4	86.0	75.9	76.8	102	46	90.1	67.0	63	63	65	64	83	48	70	67	1.10	0.40
S...	29.103	29.40	28.72	58.8	72.7	63.8	65.1	93	39	76.4	57.0	54	57	58	56	85	59	82	75	7.93	2.01
O..	29.223	29.68	28.57	49.5	66.1	56.2	57.3	84	27	68.4	47.6	45	50	49	48	85	58	77	73	2.62	1.67
N..	29.102	29.55	28.39	30.9	42.2	34.3	35.8	68	10	45.4	27.7	25	30	27	27	80	63	76	73	1.86	0.83
D..	29.268	29.81	28.69	15.3	23.8	18.4	19.2	54	-19	27.0	10.0	12	18	16	15	86	78	87	83	0.81	0.29
Y..	29.122	29.81	28.39	42.8	56.6	48.5	49.3	104	-24	60.2	40.3	38	41	41	40	83	60	77	73	29.53	.....

DETROIT, MICH.

[Latitude, 42° 20′ N.; longitude, 83° 3′ W.]

J..	29.294	29.89	28.66	22.8	27.4	24.0	24.7	55	-4	31.1	17.2	19	21	19	20	84	76	81	80	1.92	0.45
F..	29.333	29.87	28.54	25.2	31.5	27.2	28.0	54	-3	35.8	19.4	20	24	22	22	80	74	80	78	1.30	0.34
M..	29.228	29.74	28.41	31.0	40.3	35.5	35.6	61	6	43.3	28.7	27	30	30	29	84	67	80	77	1.70	0.47
A..	29.352	29.71	28.63	45.4	56.8	49.5	50.6	82	23	58.9	43.1	40	44	42	42	82	64	76	74	3.30	2.41
M..	29.235	29.60	28.86	53.2	64.7	57.4	58.4	83	40	67.9	50.0	47	52	51	50	80	64	80	75	2.33	0.76
J..	29.264	29.53	28.91	61.6	73.2	65.5	66.8	89	49	75.9	58.6	56	61	59	59	83	66	80	76	2.07	0.69
J..	29.262	29.50	29.03	65.1	77.8	70.0	71.0	92	53	80.2	62.8	60	64	62	62	83	64	78	75	2.45	2.31
A..	29.280	29.57	28.98	65.2	76.3	69.0	70.2	89	52	78.3	63.0	60	62	61	61	85	62	77	75	2.02	0.54
S..	29.361	29.67	28.95	60.3	70.4	63.6	64.8	85	43	72.8	57.6	56	57	56	56	85	64	78	76	4.20	0.94
O..	29.460	29.78	28.56	50.3	60.8	53.4	54.8	77	36	62.8	48.0	44	46	47	46	80	60	80	73	1.04	0.34
N..	29.274	29.69	28.54	36.0	42.1	37.5	38.5	65	19	45.5	31.9	30	31	30	31	79	67	76	74	2.17	0.99
D..	29.393	29.88	28.78	20.8	27.5	23.6	24.0	52	2	30.2	17.5	16	19	18	17	80	69	78	76	2.21	0.60
Y..	29.311	29.89	28.41	44.7	54.1	48.0	48.9	92	-4	56.9	41.5	40	43	42	41	82	66	79	76	26.71	.....

DODGE CITY, KANS.

[Latitude, 37° 45′ N.; longitude, 100° 0′ W.]

J..	27.420	27.83	27.06	12.6	20.8	16.0	16.5	44	-16	25.1	8.7	9	16	12	12	86	82	86	84	1.82	0.99
F..	27.420	27.80	26.82	29.7	42.8	32.5	35.0	66	-2	46.5	25.0	26	32	29	29	86	69	86	80	0.46	0.27
M..	27.343	27.65	26.84	31.0	48.8	37.2	39.0	76	9	52.3	28.8	28	35	32	32	87	64	83	78	1.50	0.47
A..	27.329	27.76	26.93	41.8	61.5	49.6	51.0	79	18	63.7	39.9	37	39	40	39	84	47	71	67	1.90	0.85
M..	27.375	27.68	26.99	57.1	79.5	65.9	67.5	94	37	82.9	55.0	51	53	54	53	82	44	68	64	0.40	0.20
J..	27.401	27.76	27.07	62.1	81.1	70.3	71.2	95	47	83.6	60.4	59	64	63	62	90	58	77	75	5.47	2.80
J..	27.406	27.60	27.20	67.3	90.1	77.1	78.2	100	62	92.0	66.8	63	67	67	66	86	48	73	69	2.07	1.57
A..	27.401	27.56	22.22	68.1	89.8	77.1	78.3	100	58	91.4	68.0	64	70	70	68	86	54	79	73	2.46	2.40
S..	27.416	27.76	27.03	57.2	79.0	66.5	67.6	90	38	80.2	56.9	54	61	61	59	89	56	84	76	2.33	1.82
O..	27.478	27.92	27.05	49.5	70.2	56.6	58.8	86	28	71.5	48.2	44	48	48	47	83	49	73	68	0.45	0.20
N..	27.432	27.87	26.89	28.4	50.8	35.2	38.1	73	7	54.2	24.2	22	29	26	26	78	46	72	65	0.24	0.15
D..	27.469	27.97	27.09	19.5	39.5	26.9	28.6	63	-5	43.5	16.3	15	23	19	19	83	54	73	70	0.25	0.16
Y..	27.407	27.97	26.82	43.7	62.8	50.9	52.5	100	-16	65.6	41.5	39	45	43	42	85	56	77	73	19.35	....

DUBUQUE, IOWA.

[Latitude, 42° 30′ N.; longitude, 90° 44′ W.]

J..	29.357	29.80	28.72	9.4	16.3	12.3	12.7	38	-23	19.6	5.3	4	10	8	7	78	76	83	79	3.17	0.87
F..	29.334	29.90	28.73	16.8	27.1	21.5	21.8	48	-21	31.3	12.8	11	18	16	15	79	69	80	76	1.36	0.48
M.	29.263	29.87	28.52	25.3	37.7	30.8	31.3	65	-1	39.9	23.3	20	26	24	24	80	66	78	74	4.32	2.53
A..	29.291	29.70	28.77	44.3	58.7	50.0	51.0	82	14	62.3	41.4	38	39	42	40	78	52	75	69	2.12	0.85
M	29.240	29.62	28.92	53.8	70.4	59.2	61.1	88	36	73.1	50.2	44	47	50	47	70	46	71	62	4.17	1.81
J..	29.262	29.60	28.99	60.9	77.8	66.5	68.4	92	42	80.4	56.9	49	54	57	53	65	46	71	61	0.71	0.25
J..	29.257	29.47	28.98	66.4	86.0	73.3	75.2	100	53	88.0	63.2	57	58	60	58	73	42	62	59	0.89	0.80
A..	29.245	29.48	29.00	66.0	84.0	72.3	74.1	97	46	85.9	63.8	59	60	61	60	80	47	69	65	0.67	0.33
S..	29.298	29.57	28.96	57.7	71.5	61.7	63.6	92	35	74.2	54.4	52	53	54	53	81	56	76	71	3.10	1.10
O..	29.430	29.88	28.48	47.1	61.7	52.5	54.8	85	26	66.8	44.1	42	44	44	43	81	48	75	68	4.08	2.41
N..	29.280	29.72	28.53	28.3	39.6	31.7	33.2	70	11	42.1	25.4	22	26	25	24	79	62	76	72	1.89	0.96
D..	29.453	30.02	28.87	9.8	22.2	15.1	15.7	50	-23	24.6	6.8	4	15	9	9	77	73	76	75	1.03	0.35
Y..	29.309	30.02	28.48	40.5	54.7	45.6	46.9	100	-23	57.4	37.3	34	38	38	36	77	57	74	69	27.51	.....

Monthly and yearly meteorological summaries—Continued.

DES MOINES, IOWA.

[H=849. T=35. h=45.]

Cloudiness (in tenths).				Wind.													Number of days.										Months and year.
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Aurora.	
6.3	7.7	6.4	6.8	4,557	20	NE., N	N.	31	17	4	5	7	8	1	14	6	5	11	15	0	19	26	30	0	0	0	J.
5.2	6.0	5.1	5.4	3,950	22	N.	N.	25	4	4	6	8	15	5	10	7	5	15	8	0	6	10	25	0	0	0	F.
7.4	7.6	6.2	7.1	3,340	22	N.	N.	20	12	7	9	8	4	2	11	20	4	12	15	0	12	4	22	0	0	0	M.
6.8	8.2	6.1	7.0	3,566	24	SW., NW.	S.	9	10	10	11	18	8	3	4	17	4	8	18	0	14	0	6	0	9	0	A.
6.0	6.0	4.7	5.6	2,933	20	NE.	NE.	12	18	6	11	13	12	6	3	12	7	14	10	0	10	0	0	2	6	0	M.
3.9	7.3	4.1	5.1	3,273	24	SW.	N.	30	7	3	9	17	9	7	5	3	6	17	7	0	5	0	0	7	2	0	J.
3.5	4.2	3.0	3.6	3,325	19	N.	NE.	11	20	5	12	7	14	11	8	5	16	10	5	0	2	0	0	21	1	1	J.
4.7	5.9	4.2	4.9	3,176	24	NW.	SW.	19	8	4	14	11	20	7	6	4	11	9	11	0	9	0	0	15	4	0	A.
5.4	6.1	4.8	5.4	4,120	24	W.	SW.	19	6	0	3	19	20	8	6	9	5	16	9	0	17	0	0	3	10	0	S.
4.3	3.8	2.5	3.5	3,804	22	SW.	SW.	7	4	5	1	15	28	10	8	15	13	14	4	0	7	0	4	0	1	0	O.
4.9	5.9	4.1	5.0	5,064	26	W.	N.	21	9	5	7	8	11	10	14	5	9	13	8	0	9	4	20	0	0	0	N.
4.1	4.1	3.3	3.8	4,262	23	N.	N.	34	11	6	6	5	18	6	2	5	14	12	5	0	7	20	28	0	0	0	D.
5.2	6.1	4.5	5.3	45,370	..	....	N.	238	126	59	94	136	167	76	91	108	99	151	115	0	117	64	135	48	33	1	Y.

DETROIT, MICH.

[H=602. T=61. h=71]

8.4	7.5	7.1	7.7	7,551	32	NW.	W.	12	9	10	9	11	9	17	16	0	2	12	17	0	20	13	27	0	0	0	J.
7.0	7.2	6.2	6.8	8,214	35	NW.	SW.	11	5	7	2	7	21	16	15	0	2	12	14	0	13	12	23	0	0	0	F.
6.0	6.3	5.3	5.9	7,660	27	S.	E.	15	14	16	3	7	11	12	14	1	8	11	12	0	15	3	21	0	1	0	M.
5.2	5.9	4.0	5.0	7,562	40	N.	E.	6	18	24	6	9	11	8	5	3	10	13	7	0	10	0	8	0	0	1	A.
5.0	5.8	3.0	4.6	6,105	27	N.	SW.	18	14	12	9	3	19	10	8	0	8	18	5	0	13	0	0	0	6	0	M.
4.4	4.9	2.9	4.1	5,603	26	NW.	N.	17	13	15	2	12	14	10	6	1	11	15	4	0	11	0	0	0	3	0	J.
4.2	4.5	3.2	4.0	5,554	24	N.	NE.	13	20	19	2	10	19	4	6	0	13	13	5	0	6	0	0	2	1	0	J.
5.0	5.8	3.0	4.6	5,618	26	SW.	SW.	7	20	16	2	8	23	9	8	0	10	15	6	0	9	0	0	0	0	0	A.
4.2	6.1	4.5	4.9	6,034	30	SW., N.	SW.	8	1	8	7	13	24	16	13	0	10	13	7	0	13	0	0	0	2	0	S.
4.3	4.4	3.4	4.0	5,145	52	W.	SW.	14	12	7	4	5	27	14	9	1	15	8	8	0	7	0	0	0	0	0	O.
6.6	7.2	5.8	6.5	6,595	34	W.	W.	10	7	3	5	5	10	32	18	0	5	13	12	0	14	3	18	0	0	0	N.
6.3	7.1	5.9	6.4	6,213	28	NW.	W.	14	8	9	6	4	13	23	16	0	5	14	12	0	15	19	28	0	0	0	D.
5.6	6.1	4.5	5.4	77,854	..	....	SW.	145	141	146	57	94	201	171	134	6	99	157	109	0	146	50	125	2	13	1	Y.

DODGE CITY, KANS.

[H=2,523. T=43. h=36.]

5.4	5.5	4.6	5.2	8,650	44	N.	NW.	20	5	5	8	16	4	9	25	1	9	13	9	0	9	21	30	0	0	0	J.
3.8	3.4	2.8	3.3	7,359	40	S., SE.	NW.	13	5	2	6	10	9	13	21	5	17	7	4	0	7	3	21	0	0	0	F.
6.1	4.5	2.4	4.3	9,689	52	S.	NW.	10	14	6	12	9	4	11	26	1	12	13	6	0	10	2	18	0	0	0	M.
3.8	4.6	3.6	4.0	10,997	56	SW.	S.	14	7	6	17	20	4	3	17	2	14	10	6	0	6	2	7	0	4	0	A.
3.3	2.6	3.0	3.0	8,319	45	S.	S.	16	13	6	14	21	3	6	12	2	16	11	4	0	5	0	0	7	0	0	M.
4.4	4.4	2.7	3.8	7,740	44	E.	SE.	9	12	17	21	16	5	2	4	4	12	14	4	0	10	0	0	5	2	0	J.
4.2	2.6	2.6	3.1	5.358	38	SE.	S.	13	5	10	18	21	3	1	2	20	17	8	6	0	8	0	0	21	1	0	J.
5.1	2.7	1.3	3.0	7,468	30	S.	S.	5	9	9	26	29	11	1	3	0	15	15	1	0	3	0	0	15	0	0	A.
4.2	4.3	3.7	4.1	7,554	35	S.	S.	2	14	10	4	36	16	3	2	3	14	9	7	0	4	0	0	2	0	0	S.
3.7	3.0	1.9	2.9	7,506	33	SE.	SE.	4	9	5	55	12	1	0	4	3	17	10	4	0	5	0	1	0	0	0	O.
1.7	2.6	1.9	2.1	6,062	44	NW.	NE.	10	16	2	11	10	9	7	14	11	20	7	3	0	3	1	22	0	0	0	N.
3.0	4.0	1.4	2.8	6,393	40	NW.	SE.	10	25	2	26	9	4	3	14	0	18	12	1	0	2	7	30	0	1	0	D.
4.1	3.7	2.7	3.5	93,086	..	....	SE.	126	134	80	218	209	73	59	144	52	181	129	55	0	72	36	129	50	8	0	Y.

DUBUQUE, IOWA.

[H=665. T=53. h=47.]

5.6	6.5	6.1	6.1	3,356	16	NW.	NW.	16	11	1	7	11	2	8	21	16	6	15	10	0	21	27	29	0	0	0	J.
5.3	6.1	4.4	5.3	3,870	20	NW.	NW.	5	2	5	4	22	4	8	23	11	7	13	8	0	11	12	25	0	0	0	F.
6.7	6.5	4.8	6.0	4,223	22	NW., NE.	NW.	7	16	7	3	14	5	9	22	10	7	13	11	0	14	4	27	0	2	0	M.
6.4	7.1	4.3	5.9	3,842	20	SE., S., W.	SE.	4	10	5	25	13	2	5	6	20	6	13	11	0	11	0	8	0	1	0	A.
6.3	5.3	2.7	4.8	3,230	20	E.	NE., S., SW., NW.	6	11	8	6	11	11	8	11	21	8	17	6	0	11	0	0	0	3	0	M.
3.1	4.8	1.2	3.0	2,274	16	NW.	NW.	7	7	1	11	12	5	4	17	15	12	11	0	0	7	0	0	3	1	0	J.
2.8	3.3	1.4	2.5	3,218	16	W.	S.	10	11	4	8	19	5	7	12	17	19	12	0	0	2	0	0	9	2	0	J.
5.4	5.1	3.3	4.6	3,261	18	S.	S.	9	4	9	9	25	8	7	15	7	10	14	7	0	9	0	0	10	2	0	A.
4.6	5.5	3.6	4.6	3,846	20	W.	S.	3	3	2	15	28	5	12	19	3	8	15	7	0	13	0	0	3	1	0	S.
3.4	3.7	2.8	3.3	3,287	25	NW.	S.	5	7	2	7	30	7	11	11	13	18	9	4	0	4	0	6	0	0	0	O.
5.2	5.4	3.5	4.7	4,133	24	SW.	W.	8	5	6	2	18	7	22	19	3	9	16	5	0	7	6	22	0	0	0	N.
4.0	4.3	3.3	3.9	2,980	18	N.	NW.	11	6	1	4	23	3	13	26	6	15	11	5	0	8	22	29	0	0	0	D.
4.9	5.3	3.4	4.5	41,520	..	....	S.	91	93	51	101	226	64	114	202	142	125	159	74	0	118	71	146	25	12	0	Y.

***Monthly and yearly meteorological summaries*—Continued.**

DULUTH, MINN.

[Latitude, 46° 48′ N.; longitude, 92° 6′ W.]

Months and year.	Pressure.			Temperature.						Mean.		Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.378	29.72	29.04	1.6	10.3	5.2	5.7	31	—32	14.5	—2.4	—2	2	1	zero	84	68	82	78	2.26	0.54
F ..	29.304	29.91	28.64	7.3	17.8	12.2	12.4	55	—25	23.9	3.2	3	8	7	6	83	66	79	76	1.81	0.51
M .	29.281	29.89	28.73	17.7	29.8	24.2	23.9	57	— 5	34.9	14.8	13	17	17	16	81	62	74	72	1.07	0.53
A ..	29.311	29.71	28.65	33.8	40.2	36.0	36.7	70	10	45.5	31.1	31	32	31	31	87	75	82	82	4.97	2.23
M	29.204	29.50	28.84	47.0	58.4	51.2	52.2	84	32	65.0	42.6	40	36	38	38	77	50	64	64	1.93	0.49
J ..	29.232	29.51	28.98	55.5	62.8	54.5	57.6	88	39	69.0	49.0	48	46	48	47	79	60	80	73	5.35	1.04
J ..	29.228	29.56	28.96	62.6	70.9	64.9	66.1	94	46	76.2	57.7	55	55	56	55	77	61	73	70	1.48	0.77
A ..	29.214	29.53	28.94	59.6	68.7	63.3	63.9	92	40	72.6	56.8	54	54	53	54	83	63	71	72	2.23	0.51
S ..	29.202	29.54	28.83	47.1	55.5	49.2	50.6	78	30	60.2	44.4	42	42	43	42	84	64	81	76	6.05	1.90
O ..	29.335	29.93	28.70	41.7	52.3	46.8	46.9	80	27	58.2	39.3	37	38	39	38	83	64	77	74	2.45	1.24
N ..	29.213	29.70	28.37	23.9	33.2	26.2	27.8	61	— 4	37.0	21.2	19	20	18	19	81	62	71	71	2.84	1.26
D ..	29.390	30.04	28.79	4.7	13.9	8.0	8.9	42	—21	18.2	—0.1	—2	6	2	2	75	70	78	75	0.93	0.53
Y ..	29.274	30.04	28.37	33.5	42.8	36.8	37.7	94	—32	47.9	29.8	28	30	29	29	81	64	76	74	33.37	....

EASTPORT, ME.

[Latitude, 44° 54′ N.; Longitude, 66° 59′ W.]

J ..	29.928	30.75	28.82	21.9	24.7	22.1	22.9	46	—15	30.5	15.0	17	18	17	17	83	75	80	79	9.01	2.02
F ..	29.850	30.83	28.51	17.7	24.6	20.5	20.9	49	—14	29.6	13.2	12	16	15	14	78	71	80	76	3.25	1.34
M .	29.743	30.61	29.00	25.2	31.4	27.8	28.1	49	— 8	34.0	21.7	20	21	21	20	79	67	76	74	2.28	.63
A ..	30.037	30.54	29.52	38.0	45.1	37.1	40.1	71	24	48.2	33.2	32	33	31	32	78	68	81	76	1.14	.86
M .	29.820	30.23	29.24	46.2	50.3	44.4	47.0	67	35	54.0	40.3	40	42	41	41	82	75	88	82	3.49	1.40
J ..	29.862	30.17	29.31	54.3	59.9	50.6	54.9	76	41	64.8	47.0	48	48	47	48	80	69	87	79	.66	.23
J ..	29.836	30.13	29.43	58.9	65.7	57.7	60.8	87	48	69.4	51.9	52	53	53	52	79	68	84	77	1.73	.70
A ..	29.863	30.28	29.30	57.6	63.4	56.7	59.2	82	47	67.2	52.3	54	55	53	54	87	76	89	84	2.41	1.27
S ..	30.030	30.48	29.53	53.1	59.1	52.6	54.9	77	37	61.7	48.1	48	48	48	48	83	69	84	79	2.73	.69
O ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....
N .	......	......	......	36.5	41.5	36.9	38.3	60	18	.....	.....	...	...	...	...	...	...	...	...	.....	.....
D ..	......	......	......	21.8	28.2	24.1	24.7	47	— 9	.....	.....	...	...	...	...	...	...	...	...	6.51	2.17
Y ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....

EL PASO, TEX.

[Latitude, 31° 47′ N.; longitude, 106° 30′ W.]

J ..	26.276	26.57	25.85	34.6	52.2	43.7	43.5	71	11	55.4	31.2	25	24	26	25	69	35	53	52	.31	.21
F ..	26.302	26.65	25.96	38.8	60.0	50.6	49.8	76	20	63.8	34.8	26	29	27	27	61	32	43	45	.44	.44
M .	26.195	26.49	25.82	41.2	63.1	54.5	52.9	82	29	68.2	39.0	25	22	24	24	54	22	33	36	.28	.28
A ..	26.150	26.46	25.95	50.0	72.8	64.7	62.5	90	33	79.8	47.8	28	24	26	26	45	17	26	29	(*)	(*)
M .	26.243	26.49	26.05	63.5	89.1	77.7	76.8	105	54	95.7	62.1	40	44	44	42	44	22	32	32	.01	.01
J ..	26.210	26.44	25.98	67.3	90.2	79.2	78.9	110	55	99.3	65.9	50	50	50	50	57	28	40	42	1.03	.75
J ..	26.236	26.41	26.03	71.8	92.9	82.4	82.4	111	63	102.0	70.3	60	62	61	61	68	38	50	52	1.62	.62
A ..	26.254	26.37	26.12	71.0	89.7	80.1	80.3	104	65	97.5	69.6	61	63	62	62	70	42	54	56	1.85	.70
S ..	26.282	26.54	26.13	63.7	80.8	71.1	71.9	98	43	85.4	62.1	58	61	60	60	81	53	69	68	1.16	.48
O ..	26.316	26.64	26.10	52.0	73.6	62.9	62.8	84	41	77.4	50.0	46	54	51	50	82	52	66	66	.80	.56
N ..	26.341	26.65	25.99	38.5	57.6	48.3	48.1	74	17	61.8	35.7	29	34	32	32	69	43	56	56	.52	.34
D ..	26.351	26.61	26.10	37.4	58.6	47.1	47.7	74	23	62.7	34.0	28	35	33	32	68	42	59	56	.04	.04
Y ..	26.263	26.65	25.83	52.5	73.4	63.5	63.1	111	11	79.1	50.2	40	42	42	41	64	35	48	49	8.06	....

ERIE, PA.

[Latitude, 42° 7′ N.; Longitude, 80° 5′ W.]

J ..	29.261	29.94	28.48	21.8	24.7	22.9	23.1	59	— 4	33.8	16.6	18	20	19	19	86	82	86	85	4.80	1.02
F ..	29.313	29.85	28.52	21.2	26.9	23.7	23.9	58	—11	35.1	15.6	16	19	17	17	81	74	78	78	3.43	1.67
M .	29.200	29.66	28.47	29.5	34.3	31.4	31.7	68	— 1	41.9	24.3	25	27	26	26	86	76	81	81	3.03	.83
A ..	29.335	29.68	28.72	44.6	50.1	46.1	46.9	78	21	57.1	37.8	37	37	39	38	76	66	78	73	3.05	1.81
M .	29.207	29.60	28.78	54.7	58.6	54.0	55.8	77	37	64.2	47.0	45	45	44	44	71	62	70	68	1.48	.66
J ..	29.243	29.49	28.85	62.6	68.5	61.3	64.1	88	45	72.6	54.1	52	54	53	53	70	61	76	69	2.77	1.20
J ..	29.235	29.47	29.02	65.9	72.4	66.3	68.2	90	53	76.4	59.8	56	57	57	56	71	60	72	68	2.16	1.37
A ..	29.260	29.53	28.96	65.1	73.4	66.8	68.4	86	51	77.0	61.0	56	59	57	58	74	63	73	70	1.53	.40
S ..	29.353	29.66	29.00	61.2	68.3	63.1	64.2	87	44	75.9	54.8	52	56	52	53	73	65	69	69	3.26	.99
O ..	29.438	29.71	28.66	49.7	58.0	52.2	53.3	78	33	63.5	45.2	41	45	45	44	73	64	77	71	1.73	.39
N ..	29.245	29.67	28.53	36.8	41.5	38.5	38.9	70	14	49.2	31.4	30	31	31	30	77	69	75	74	6.21	1.57
D ..	29.359	29.86	28.67	24.2	28.0	25.1	25.8	53	— 2	38.6	17.8	20	23	20	21	83	81	83	82	4.04	1.10
Y ..	29.287	29.94	28.47	44.8	50.4	46.0	47.1	90	—11	57.1	38.8	37	39	38	38	77	69	76	74	37.49	....

* Inappreciable.

***Monthly and yearly meteorological summaries*—Continued.**

DULUTH, MINN.

[$H=672$. $T=60$. $h=56$.]

Cloudiness (in tenths.)				Wind.													Number of days.										
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Month and year.
7.0	6.8	4.9	6.2	6,425	40	NW.	NW.	6	12	2	12	3	15	5	35	3	3	18	10	0	21	31	31	0	0	1	J.
5.8	5.8	4.3	5.3	6,084	40	NE.	NW.	4	23	1	4	8	12	3	24	5	5	16	7	0	15	19	27	0	0	0	F.
5.0	5.6	3.5	4.7	5,311	36	SW.	NE.	6	43	1	1	4	8	4	17	9	12	11	8	0	9	13	31	0	0	1	M.
4.5	4.5	3.5	4.2	4,682	36	NW.	NE.	3	56	5	6	0	2	2	8	8	11	14	5	0	11	2	10	0	3	3	A.
4.3	4.1	2.6	3.7	4,992	28	NE.	NE.	8	31	1	8	1	5	9	26	3	13	14	3	0	13	0	1	0	1	0	M.
4.7	5.1	3.1	4.3	3,940	28	NE.	NE.	7	38	3	5	2	2	7	22	4	10	15	5	0	20	0	0	0	6	3	J.
2.9	3.8	2.9	3.2	4,160	23	NW.	NE.	3	40	3	3	2	9	9	15	9	15	13	3	0	10	0	0	3	3	0	J.
3.1	3.9	2.4	3.1	4,453	28	NW.	NE.	4	35	3	5	5	15	5	20	1	16	13	2	0	10	0	0	2	5	2	A.
4.9	5.2	3.7	4.6	4,607	30	NW.	NE.	1	29	0	6	1	14	23	14	2	7	18	5	2	15	0	1	0	2	2	S.
4.2	3.8	3.3	3.8	4,156	30	SW.	NE.	4	31	2	5	7	13	6	11	14	13	13	5	0	11	0	7	0	1	3	O.
4.7	4.9	4.3	4.6	5,789	40	NE.	SW.	5	9	2	3	1	31	12	25	2	12	10	8	0	12	9	25	0	0	1	N.
4.7	4.8	4.3	4.6	4,174	38	NW.	SW.	0	6	0	6	10	33	12	22	4	10	13	8	0	10	24	31	0	0	0	D.
4.6	4.9	3.6	4.4	58,773	..	....	NE.	51	353	23	64	44	159	97	239	64	127	168	69	2	157	98	164	5	21	16	Y.

EASTPORT, ME.

[$H=61$. $T=33$. $h=58$.]

7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Month and year.
7.2	7.1	5.9	6.7	8,700	60	NE.	NW.	12	17	10	7	5	5	6	26	5	6	10	15	0	20	11	26	0	0	0	J.
7.2	6.4	6.5	6.7	8,736	40	NW.	NW.	6	8	5	5	10	10	7	29	4	3	11	14	0	16	14	26	0	1	1	F.
7.2	5.9	5.4	6.2	7,130	44	E.	NW.	13	4	12	0	3	10	9	29	13	4	16	11	0	14	10	27	0	0	5	M.
3.5	4.5	2.6	3.5	5,246	58	NE.	S.	20	8	7	1	22	12	4	8	8	16	9	5	1	6	1	11	0	0	5	A.
4.6	6.2	4.5	5.1	4,523	29	E.	S.	14	7	5	3	38	2	2	4	18	6	21	4	1	14	0	0	0	1	6	M.
3.5	4.9	3.8	4.1	3,874	25	NW.	S.	3	5	4	3	41	7	5	11	11	9	18	3	2	8	0	0	0	0	4	J.
3.6	4.9	2.1	3.5	3,014	20	E.	S.	2	2	4	1	37	6	9	8	24	10	19	2	6	9	0	0	0	1	1	J.
3.7	2.5	2.3	2.8	3,993	25	NE.	S.	14	5	4	1	44	5	8	4	8	16	13	2	0	9	0	0	0	0	3	A.
5.0	4.6	4.0	4.5	5,379	24	NW., S.	S.	9	3	10	5	25	7	11	15	5	10	11	9	0	14	0	0	0	1	5	S.
4.6	5.4	3.5	4.5	......	..	....	S.	16	10	5	1	22	8	8	13	10	...	...	...	..	...	..	...	...	0	8	O.
6.3	7.1	4.7	6.0	......	..	....	W.	7	5	3	5	11	12	26	15	6	...	...	...	..	...	..	...	...	0	1	N.
6.9	6.5	4.8	6.1	......	..	....	NW.	11	17	3	1	5	12	17	21	6	7	17	12	0	17	..	...	...	0	1	D.
5.3	5.5	4.2	5.0	......	..	....	S.	127	91	72	33	263	96	112	183	118	...	...	...	..	...	..	...	...	4	40	Y.

EL PASO, TEX.

[$H=3,764$. $T=21$. $h=34$.]

7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Month and year.
2.4	3.9	3.1	3.1	3,623	28	W.	NW.	5	7	7	3	1	1	21	40	8	18	9	4	0	2	0	16	0	0	0	J.
2.7	3.7	2.3	2.9	2,985	24	NE.	NW.	7	5	11	6	2	5	19	23	6	15	11	2	0	1	0	13	0	0	0	F.
2.4	3.5	2.5	2.8	4,199	25	W.	W.	0	1	7	5	0	9	44	23	7	18	9	4	0	1	0	5	0	0	0	M.
1.5	2.5	0.8	1.6	4,665	25	W.	W.	2	5	11	4	3	9	43	6	7	22	7	1	0	0	0	0	1	0	0	A.
2.7	4.0	4.4	3.7	3,067	21	SW.	W.	3	5	19	5	2	1	29	14	15	14	12	5	0	1	0	0	26	0	0	M.
1.5	2.7	2.9	2.4	2,492	29	N.	E.	4	12	24	6	1	4	22	8	9	20	9	1	0	6	0	0	25	6	0	J.
4.0	5.3	4.3	4.5	2,341	30	N.	E.	4	7	27	10	2	2	12	7	22	10	19	2	0	11	0	0	30	8	0	J.
3.8	4.0	3.8	3.9	3,464	28	N.	E.	1	11	33	16	1	5	14	12	0	11	19	1	0	11	0	0	30	6	0	A.
3.8	4.8	3.3	4.0	2,202	24	E.	E.	0	12	23	2	1	4	8	4	8	6	13	1	0	6	0	0	3	7	0	S.
1.6	1.8	1.1	1.5	2,736	20	W	W.	6	13	17	5	5	9	20	3	15	22	8	1	0	3	0	0	0	2	0	O.
2.8	3.1	2.3	2.7	3,228	23	SW.	W.	2	13	6	0	2	10	33	7	17	17	10	3	0	4	0	8	0	0	0	N.
1.1	2.4	0.8	1.4	3,123	26	W.	W.	2	7	9	0	1	17	41	1	15	26	5	0	0	1	0	12	0	0	0	D.
2.5	3.5	2.6	2.9	38,125	..	....	W.	36	98	194	62	21	76	303	148	129	199	131	25	0	47	0	54	115	29	0	Y.

ERIE, PA.

[$H=681$. $T=64$. $h=49$.]

7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Month and year.
7.7	8.9	7.8	8.1	9,303	43	NW.	S.	7	3	16	4	20	12	11	18	2	4	5	22	0	23	12	29	0	0	0	J.
7.4	6.5	6.1	6.7	8,892	37	NW.	S.	5	10	3	0	20	19	13	13	1	3	13	12	0	18	10	23	0	0	0	F.
6.8	6.5	6.2	6.5	7,333	33	S.	E., W., NW.	7	7	19	0	9	11	19	19	2	6	9	16	0	15	7	27	0	2	0	M.
4.1	4.5	4.5	4.4	7,160	33	E., S.	NE.	3	22	18	3	15	10	9	7	3	14	8	8	0	10	1	10	0	1	0	A.
4.6	4.4	3.2	4.1	5,983	26	SW.	SW.	6	15	4	8	11	25	16	7	1	12	15	4	0	9	0	0	0	5	1	M.
4.2	4.0	3.0	3.7	5,357	24	W.	SW.	9	14	3	5	13	19	18	7	2	14	11	5	0	12	0	0	0	1	0	J.
4.1	3.6	4.1	3.9	4,609	24	N.	S.	12	12	9	5	19	13	17	6	0	14	12	5	0	9	0	0	1	5	1	J.
4.4	4.2	3.6	4.1	5,582	24	NW.	S.	6	15	8	13	20	7	10	14	0	13	12	6	0	9	0	0	0	4	0	A.
5.4	5.2	2.3	4.3	6,879	30	NW.	SW., NW.	10	11	2	10	16	17	7	17	0	10	17	3	0	8	0	0	0	5	0	S.
5.9	5.1	3.9	5.0	6,554	36	SW.	S.	5	10	9	2	23	18	8	15	3	10	11	10	0	14	0	0	0	1	0	O.
7.4	8.0	7.3	7.6	10,039	43	W.	SW.	4	9	3	4	12	27	16	15	0	2	11	17	0	19	0	19	0	0	0	N.
8.2	7.5	7.2	7.6	8,421	42	W.	SW.	4	6	6	10	13	26	14	14	0	5	5	21	0	23	8	27	0	0	0	D.
5.8	5.7	4.9	5.5	86,112	..	....	SW.	78	134	100	64	191	204	158	152	14	107	129	129	0	169	38	135	1	24	2	Y.

Monthly and yearly meteorological summaries—Continued.

ESCANABA, MICH.

[Latitude, 45° 48′ N.; longitude, 87° 5′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.370	29.82	28.80	9.6	16.6	12.1	12.8	35	—22	19.3	6.1	5	10	8	8	82	77	81	80	4.80	1.09
F ..	29.339	29.95	28.47	9.5	19.7	14.2	14.5	38	—19	23.7	5.8	5	13	10	9	80	74	82	79	1.84	.34
M .	29.299	29.93	28.52	18.2	30.4	24.7	24.4	47	— 7	32.2	15.8	14	22	20	19	83	73	80	79	3.15	.86
A ..	29.395	29.80	28.61	32.6	43.9	37.6	38.0	62	zero	47.1	29.8	28	34	32	32	84	71	80	78	2.28	1.24
M .	29.267	29.58	28.93	46.0	54.1	49.9	50.0	80	26	59.0	41.3	38	40	41	40	74	61	73	69	1.53	.31
J ..	29.289	29.57	28.98	55.5	66.9	57.7	60.0	86	38	71.3	50.8	48	52	50	50	78	60	77	72	2.21	.73
J ..	29.293	29.57	29.00	61.1	70.8	64.5	65.5	86	44	74.8	56.0	53	57	55	55	76	64	72	71	1.92	1.01
A ..	29.291	29.59	29.00	58.8	68.0	61.6	62.8	80	42	70.4	54.7	54	57	56	56	86	70	81	70	4.38	1.56
S ..	29.315	29.66	28.87	51.1	59.2	54.6	55.0	76	33	62.4	47.2	48	51	50	50	87	76	85	83	4.06	1.22
O ..	29.446	29.97	28.49	43.7	53.3	47.5	48.2	70	24	55.5	39.3	40	45	43	43	86	74	81	82	3.03	2.27
N ..	29.258	29.72	28.39	27.0	34.5	28.8	30.1	57	5	37.2	22.3	20	23	24	22	74	66	81	74	2.26	1.03
D ..	29.406	29.99	28.92	11.7	19.4	13.8	15.0	39	—15	22.4	6.9	7	11	9	9	80	71	80	78	.90	.41
Y ..	29.330	29.99	28.39	35.4	44.7	38.9	39.7	86	—22	47.9	31.3	30	36	33	33	81	70	80	77	32.36	....

FORT ALEXANDER, ALASKA.

[Latitude, 53° 54′ N.; longitude, 153° 14′ W.]

J ..	29.921	30.50	29.12	10.3	10.7	11.6	10.9	40	—27	19.7	4.5	7	8	9	8	84	87	85	86	1.06	.58
F ..	29.580	30.46	28.65	9.4	9.5	11.1	10.0	39	—12	17.8	4.3	7	7	8	7	86	87	85	86	1.63	.46
M ..	29.671	30.28	28.96	18.6	18.5	20.1	19.1	38	— 4	26.5	12.3	15	16	17	16	87	88	87	87	2.85	1.00
A ..	29.811	30.67	29.24	25.1	25.6	30.5	27.1	44	9	35.0	21.5	22	22	27	24	89	87	88	88	1.31	.48
M ..	29.825	30.31	29.24	34.8	36.3	38.9	36.7	52	26	42.2	32.1	31	32	33	32	87	85	80	84	2.39	.73
J ..	......	.....	.....	....	....	....	....	....	....	....	......	....	....	....	....	....	....	....	....	......	.....
J ..	......	.....	.....	....	....	....	....	....	....	....	......	....	....	....	....	....	....	....	....	......	.....
A ..	......	.....	.....	....	....	....	....	....	....	....	......	....	....	....	....	....	....	....	....	......	.....
S ..	......	.....	.....	....	....	....	....	....	....	....	......	....	....	....	....	....	....	....	....	......	.....
O ..	......	.....	.....	....	....	....	....	....	....	....	......	....	....	....	....	....	....	....	....	......	.....
N ..	......	.....	.....	....	....	....	....	....	....	....	......	....	....	....	....	....	....	....	....	......	.....
D ..	......	.....	.....	....	....	....	....	....	....	....	......	....	....	....	....	....	....	....	....	......	.....
Y ..	......	.....	.....	....	....	....	....	....	....	....	......	....	....	....	....	....	....	....	....	......	.....

FORT APACHE, ARIZ.

[Latitude, 33° 48′ N.; longitude, 109° 57′ W.]

J ..	25.041	25.26	24.64	27.1	43.9	33.4	34.8	64	— 9	48.4	23.7	22	31	26	26	81	64	76	74	3.90	1.09
F ..	25.073	25.36	24.76	30.9	56.8	40.3	42.7	71	14	61.5	26.3	23	24	24	24	72	33	55	54	2.73	1.29
M ..	24.987	25.21	24.72	30.2	55.4	40.8	42.1	76	19	59.8	25.7	23	24	26	24	73	33	56	54	1.06	.69
A ..	24.952	25.15	24.70	36.8	65.2	47.9	50.0	79	23	68.9	32.3	27	24	26	25	67	23	45	45	.91	.42
M ..	25.079	25.20	24.91	46.5	82.5	60.8	63.3	96	33	85.8	42.6	28	30	28	28	49	17	29	32	.00	.00
J ..	25.040	25.17	24.83	52.3	87.9	67.2	69.1	101	40	92.9	47.1	27	43	38	36	39	23	35	32	.19	.10
J ..	25.082	25.23	24.95	61.9	87.7	71.9	73.8	100	54	94.4	60.2	49	53	53	51	64	34	54	51	1.90	.62
A ..	25.092	25.20	24.94	62.3	83.1	70.0	71.8	97	53	88.9	60.2	55	57	50	57	77	45	72	64	4.75	1.35
S ..	25.069	25.22	24.92	52.9	76.1	62.9	64.0	89	42	80.9	50.6	46	53	51	50	77	49	68	64	3.16	2.11
O ..	25.085	25.30	24.85	41.9	67.8	52.2	54.0	80	28	70.5	38.7	33	38	36	35	71	36	55	54	1.66	.95
N ..	25.098	25.38	24.68	28.3	53.2	37.1	59.5	72	4	56.8	24.5	19	24	22	22	70	35	56	54	.56	.49
D ..	25.112	25.34	24.84	27.8	56.0	37.1	40.3	67	18	60.2	24.8	23	25	25	24	82	32	62	58	.24	.24
Y ..	25.059	25.38	24.64	41.6	68.0	51.8	53.8	101	— 9	72.4	38.1	31	36	35	34	68	35	55	53	21.06	....

FORT ASSINABOINE, MONT.

[Latitude, 48° 32′ N.; longitude, 109° 42′ W.]

J ..	27.234	27.86	26.74	-2.2	3.4	0.0	0.4	46	—49	9.0	—11.7	—12	—8	—10	—10	60	60	61	60	1.50	.74
F ..	27.112	27.41	26.72	26.8	35.3	28.7	30.3	63	—15	41.1	18.5	17	22	19	19	66	60	66	64	.77	.59
M .	27.090	27.54	26.59	22.6	34.3	29.2	28.7	65	—19	39.1	16.8	12	21	19	17	64	59	64	62	.85	.72
A ..	27.050	27.53	26.63	37.0	54.8	46.7	46.2	78	16	60.5	33.0	26	29	30	28	66	40	54	53	1.83	.89
M .	27.129	27.38	26.77	46.8	66.1	57.1	56.7	95	26	71.7	43.0	32	35	36	34	58	35	47	46	.99	.59
J ..	27.152	27.56	26.90	55.5	74.9	65.7	65.4	95	39	80.7	52.4	42	46	47	45	63	38	53	51	1.38	.51
J ..	27.147	27.36	26.94	62.8	81.2	75.3	74.1	108	47	90.2	58.3	49	52	53	51	62	36	49	49	.47	.41
A ..	27.153	27.47	26.91	57.2	78.6	68.6	68.1	96	38	83.8	51.5	43	43	44	44	61	31	44	46	.35	.21
S ..	27.161	27.41	26.74	45.6	61.8	52.8	53.4	85	31	66.6	41.6	35	37	38	37	69	44	57	57	1.47	.73
O ..	27.193	27.55	26.86	40.1	53.1	44.4	45.9	81	19	57.0	35.2	29	35	29	31	67	52	58	59	.51	.30
N ..	27.214	27.78	26.82	24.3	35.9	28.8	29.7	61	—27	40.9	15.3	14	21	16	17	64	55	59	60	.74	.58
D .	27.203	27.72	26.78	16.8	22.3	17.5	18.9	62	—37	27.6	6.9	7	10	7	8	66	58	62	62	.62	.46
Y ..	27.153	27.85	26.59	36.1	50.4	42.9	43.1	108	—49	55.7	30.1	25	29	27	27	64	47	56	56	11.48	....

Monthly and yearly meteorological summaries—**Continued.**

ESCANABA, MICH.

[$H = 608.$ $T = 49.$ $h = 34.$]

Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.9	8.0	6.5	7.5	7,127	30	N.	N.	27	20	3	0	6	13	5	18	1	0	15	16	0	22	25	30	0	0	1	J.
7.5	7.0	5.4	6.6	6,533	34	N.	NW.	16	14	1	3	11	16	5	17	1	5	9	14	0	17	17	27	0	0	3	F.
6.8	6.4	5.8	6.3	6,660	29	N.	N.	34	24	2	2	13	10	2	5	1	8	8	15	0	16	11	29	0	1	3	M.
5.7	5.2	4.4	5.1	4,657	32	NW.	S.	17	20	4	8	31	3	0	7	0	9	11	10	1	12	4	10	0	2	4	A.
6.7	6.0	4.6	5.8	5,476	24	NW., N	S.	24	14	3	0	32	11	0	9	0	4	19	8	0	17	0	2	0	3	0	M.
5.4	6.2	4.5	5.4	4,875	24	N., NW	S.	25	9	0	7	30	10	1	7	1	8	12	10	0	14	0	0	0	4	1	J.
4.5	4.5	3.6	4.2	5,134	21	N.	S.	27	11	1	3	28	16	2	3	2	10	18	3	0	8	0	0	0	3	1	J.
4.5	4.9	3.5	4.3	5,352	20	NE.	SW.	20	16	1	4	13	24	4	10	1	13	11	7	0	9	0	0	0	5	2	A.
5.4	5.4	5.6	5.5	5,328	26	SW.	SW.	10	5	2	7	20	24	16	6	0	5	16	9	0	15	0	0	0	5	3	S.
4.2	4.2	4.3	4.2	6,038	27	N.	SW.	17	10	0	2	13	33	5	13	0	12	11	8	0	8	0	6	0	0	5	O.
6.1	6.7	4.6	5.8	6,670	28	NE.	NW.	10	9	3	2	2	23	13	28	0	7	13	10	0	14	9	27	0	0	6	N.
5.7	6.5	3.9	5.4	6,121	28	SW.	NW.	24	5	0	0	3	22	14	25	0	8	16	7	0	10	24	28	0	0	4	D.
5.9	5.9	4.7	5.5	69,971	...	....	N.	251	157	20	38	202	205	67	148	7	89	159	117	1	162	90	159	0	23	33	Y.

FORT ALEXANDER, ALASKA.

[$H = 38.$ $T = 5.$ $h = 1.$]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.7	3.6	2.0	3.1	......	...	....	E.	0	31	47	4	6	3	2	0	0	18	7	6	0	5	23	30	0	0	0	J.
4.6	5.2	5.3	5.0	......	...	....	E.	5	18	45	3	6	2	3	1	1	11	6	11	0	10	18	28	0	0	0	F.
7.6	7.3	7.4	7.4	......	...	....	E.	0	20	25	7	8	12	12	7	2	5	5	21	0	18	18	31	0	0	0	M.
5.3	4.3	4.9	4.8	......	...	....	E.	1	25	30	6	3	18	7	0	0	11	9	10	0	6	5	30	0	0	0	A.
8.2	8.1	5.9	7.4	......	...	....	S.	5	12	11	15	22	18	9	1	0	3	8	20	0	11	0	16	0	0	0	M.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	J.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	J.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	A.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	S.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	O.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	N.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	D.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Y.

FORT APACHE, ARIZ.

[$H = 5{,}020.$ $T = 5.$ $h = 1.$]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.5	4.8	3.7	4.0	3,518	30	SW.	NE.	7	34	8	4	6	23	3	3	5	16	5	10	0	12	2	24	0	1	0	J.
1.8	3.6	1.7	2.4	4,135	27	NE., N.	NE.	8	36	7	4	5	20	3	0	1	18	9	1	0	6	0	22	0	0	0	F.
1.1	4.3	1.5	2.3	5,605	33	NW.	NE., SW	12	22	11	12	6	22	3	4	1	19	11	1	0	5	0	25	0	0	0	M.
1.8	2.4	1.3	1.8	6,329	36	SW.	SW.	6	15	7	7	16	32	7	0	0	23	5	2	0	5	0	14	0	0	0	A.
1.4	3.4	1.7	2.2	5,923	37	SW.	NE.	3	41	5	3	7	27	6	1	0	20	10	1	0	0	0	0	10	0	0	M.
0.5	2.5	1.0	1.3	5,548	29	SE.	NE.	0	42	10	4	6	18	6	4	0	24	5	1	0	3	0	0	21	3	0	J.
4.5	6.4	3.8	4.9	4,439	35	NE.	NE.	3	40	12	4	7	20	3	2	2	7	19	5	0	10	0	0	24	1	0	J.
3.6	6.2	4.7	4.8	4,251	34	W.	E.	4	22	23	4	10	19	9	0	2	4	23	4	0	10	0	0	12	2	0	A.
2.5	4.7	2.0	3.1	4,342	32	NE.	E.	2	18	22	12	2	12	9	9	4	14	15	1	0	8	0	0	0	2	0	S.
1.5	3.0	2.2	2.2	5,164	28	SW.	E.	1	10	28	7	7	23	6	3	8	20	10	1	0	5	0	7	0	3	0	O.
2.3	3.1	2.1	2.5	4,117	43	SW.	NE., E.	2	23	23	4	4	19	4	3	8	21	6	3	0	3	0	26	0	0	0	N.
1.9	2.8	1.9	2.2	3,576	20	S., W., NE.	NE.	5	16	26	4	4	16	8	2	12	23	7	1	0	1	0	28	0	0	0	D.
2.2	3.9	2.3	2.8	56,947	...	....	E.	53	319	182	69	80	251	67	31	43	209	125	31	0	68	2	146	67	12	0	Y.

FORT ASSINABOINE, MONT.

[$H = 2{,}690.$ $T = 14.$ $h = 4.$]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.2	5.5	5.7	5.5	7,005	45	SW.	SW.	4	3	17	3	3	24	16	16	7	7	15	9	0	9	25	31	0	0	0	J.
6.4	5.9	5.1	5.8	9,417	55	W.	SW.	2	4	13	9	2	31	15	8	0	4	17	7	0	6	7	22	0	0	0	F.
4.6	5.5	4.1	4.7	7,786	54	W.	SW.	1	5	13	12	5	30	20	7	0	9	16	6	0	5	8	27	0	0	0	M.
3.3	4.1	4.5	4.0	8,397	37	NW.	SW.	5	3	10	10	17	27	7	11	0	12	14	4	0	6	0	11	0	1	1	A.
4.5	4.3	3.9	4.2	8,425	45	W.	NW.	10	12	9	7	6	10	19	20	0	9	20	2	0	4	0	6	4	0	1	M.
4.5	5.0	5.5	5.0	7,184	45	S.	W.	5	7	8	12	5	14	24	15	0	6	19	5	0	8	0	0	6	4	0	J.
3.6	3.0	3.5	3.4	7,786	59	W.	W.	8	14	13	7	6	8	25	12	0	14	16	1	0	2	0	0	17	2	1	J.
3.5	2.1	3.9	3.2	6,855	42	SW.	W.	3	10	11	13	5	19	22	9	1	15	15	1	0	4	0	0	9	0	0	A.
6.1	5.0	3.4	4.8	7,648	41	W.	SW.	4	2	2	1	9	36	25	11	0	10	11	9	0	5	0	1	0	2	0	S.
5.3	5.4	5.0	5.2	8,194	48	W.	SW.	2	7	7	10	12	39	9	7	0	11	9	11	0	4	0	9	0	0	0	O.
3.5	5.6	4.6	4.6	10,310	49	SW.	SW.	1	3	13	4	5	49	10	5	0	9	16	5	0	4	4	27	0	0	2	N.
5.0	6.3	5.6	5.6	7,970	52	S.	SW.	8	13	6	2	4	44	10	3	3	6	16	9	0	4	16	29	0	0	0	D.
4.6	4.8	4.6	4.7	96,977	...	....	SW.	53	83	122	90	79	331	202	124	11	112	184	69	0	61	60	163	36	9	5	Y.

***Monthly and yearly meteorological summaries*—Continued.**

FORT BIDWELL, CAL.

[Latitude, 41° 53′ N.; longitude, 120° 11′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	25.350	25.75	24.71	25.4	34.6	30.3	30.1	52	— 4	38.1	21.7	22	29	26	26	85	81	85	84	5.78	1.02
F ..	25.462	25.82	24.93	33.4	46.5	40.6	40.2	67	19	52.3	30.9	24	32	30	29	69	58	66	64	2.16	0.99
M .	25.350	25.67	24.93	29.0	40.6	36.4	35.3	67	18	45.6	26.5	21	29	26	25	71	63	66	67	1.48	0.45
A ..	25.288	25.65	24.96	35.2	47.6	42.7	41.8	67	25	52.9	36.0	26	30	30	29	69	53	64	62	2.20	0.62
M .	25.393	25.60	25.20	44.3	61.5	54.9	53.6	82	20	66.5	40.5	28	34	30	31	55	39	43	46	1.44	0.46
J ..	25.384	25.54	25.24	51.4	69.5	62.7	61.2	86	33	75.0	47.1	31	36	33	33	48	31	36	38	0.78	0.42
J ..	25.309	25.49	25.25	57.7	77.5	69.4	68.2	95	38	82.9	53.1	31	39	36	35	37	27	34	32	0.41	0.13
A ..	25.393	25.51	25.26	58.1	79.2	71.6	69.6	92	44	84.9	53.0	33	37	29	33	40	24	23	29	0.04	0.04
S ..	25.438	25.63	25.26	49.2	69.8	61.7	60.2	88	32	75.5	42.9	30	34	29	31	50	28	31	36	0.00	0.00
O ..	25.420	25.68	25.16	39.3	50.0	44.6	44.6	79	22	56.5	32.8	32	34	31	32	76	58	62	65	1.36	0.36
N ..	25.542	25.84	24.81	27.7	39.2	34.0	33.6	60	8	45.9	20.6	23	26	23	24	82	60	66	69	1.06	0.41
D ..	25.463	25.82	25.17	35.7	41.5	38.0	38.4	55	17	46.5	28.8	33	33	31	33	90	74	78	80	4.25	1.02
Y ..	25.417	25.84	24.71	40.5	54.8	48.9	48.1	95	— 4	60.2	36.2	28	33	30	30	64	50	54	56	20.96	....

FORT BRIDGER, WYO.

[Latitude, 41° 28′ N.; longitude, 110° 30′ W.]

J ..	23.408	23.71	22.90	16.1	26.9	19.9	21.0	47	—11	30.8	10.8	10	18	14	14	78	70	78	75	0.56	0.18
F ..	23.525	23.88	22.97	24.6	35.6	27.5	29.2	53	6	39.9	19.2	18	20	20	19	76	54	73	68	0.43	0.39
M .	23.394	23.67	22.97	19.0	31.5	23.4	24.6	50	— 6	35.1	14.2	15	20	19	18	82	62	82	75	0.82	0.21
A ..	23.390	23.70	23.06	30.4	43.9	34.4	36.2	60	18	48.2	27.0	26	25	26	26	82	49	75	68	1.24	0.55
M .	23.549	23.79	23.27	38.2	62.0	47.2	49.1	80	17	65.9	35.3	28	33	33	32	70	36	60	55	0.20	0.20
J ..	23.557	23.70	23.18	42.0	66.9	54.8	54.6	80	29	70.9	39.9	35	44	42	40	77	44	64	62	1.16	0.65
J ..	23.614	23.76	23.45	49.9	77.5	63.6	63.7	89	34	81.1	47.4	41	51	48	46	72	42	57	57	0.12	0.09
A ..	23.609	23.73	23.44	52.0	74.4	61.1	62.5	86	37	78.5	49.4	43	52	48	47	72	47	63	61	1.17	0.25
S ..	23.572	23.80	23.36	40.5	65.2	47.8	51.2	78	15	68.0	36.1	30	36	34	33	69	38	60	56	0.06	0.04
O ..	23.532	23.89	23.19	31.1	50.6	37.0	39.6	69	10	53.3	27.6	27	32	31	30	86	53	78	72	0.93	0.36
N ..	23.540	23.93	22.78	19.5	29.9	23.2	24.2	47	—13	32.8	15.0	15	20	17	18	84	70	77	77	1.29	0.50
D ..	23.532	23.86	23.22	25.9	35.9	28.2	30.0	49	6	38.6	20.6	20	22	20	21	77	59	73	70	0.32	0.19
Y ..	23.519	23.93	22.78	32.4	50.0	39.0	40.5	89	—13	53.6	28.5	26	31	29	29	77	52	70	66	8.30	....

FORT BUFORD, DAK.

[Latitude, 48° 0′ N.; longitude, 103° 56′ W.]

J ..	28.085	28.64	27.54	-9.3	0.9	—4.1	—4.2	44	—48	7.2	-15.1	—11	— 3	— 6	— 7	92	84	91	89	0.41	0.11
F ..	27.951	28.37	27.51	11.6	22.7	18.0	17.4	51	—26	30.5	6.0	8	16	14	13	87	77	86	83	0.71	0.25
M .	27.923	28.42	27.36	19.5	33.7	25.3	26.2	69	—10	37.3	15.9	16	23	21	20	87	66	84	79	0.31	0.09
A ..	27.871	28.35	27.23	34.2	54.4	44.3	44.3	79	11	58.3	32.5	30	31	32	31	86	44	64	65	2.25	1.13
M .	27.900	28.16	27.53	47.1	66.3	56.3	56.6	89	11	70.9	44.6	39	34	39	37	75	36	54	55	1.44	0.41
J ..	27.928	28.32	27.69	55.7	76.1	65.9	65.9	94	36	79.5	52.9	46	42	47	45	73	34	53	53	0.93	0.33
J ..	27.908	28.19	27.55	63.5	87.3	75.9	75.6	106	50	91.1	61.8	52	46	49	49	67	26	40	44	0.56	0.28
A ..	27.911	28.16	27.65	57.1	80.4	68.4	68.6	104	34	84.5	56.1	47	46	46	46	72	34	46	51	0.87	0.60
S ..	27.909	28.19	27.45	42.6	64.7	51.4	52.9	86	20	69.0	39.7	37	44	39	40	81	48	66	65	0.05	0.02
O ..	27.969	28.51	27.54	36.1	54.9	43.5	41.8	85	22	58.2	33.2	33	43	38	38	90	67	84	80	1.57	0.67
N ..	27.978	28.48	27.53	20.6	32.5	22.8	25.3	57	—10	37.7	14.6	19	25	20	21	93	76	89	86	0.59	0.26
D ..	28.050	28.68	27.51	4.7	11.2	6.5	7.5	45	—33	16.9	—3.8	3	8	4	5	94	86	93	91	0.55	0.18
Y ..	27.948	28.68	27.23	32.0	48.8	39.5	40.1	106	—48	53.4	28.2	27	30	29	28	83	56	71	70	10.24	....

FORT CANBY, WASH.

[Latitude, 46° 16′ N.; longitude 124° 4′ W.]

J ..	29.722	30.30	28.92	38.6	41.1	40.5	40.1	51	21	44.3	36.7	37	39	39	38	92	94	94	93	6.33	1.06
F ..	29.887	30.35	29.44	44.6	47.9	47.2	46.6	55	33	50.2	43.4	42	44	43	43	91	88	87	89	4.77	0.73
M .	29.814	30.25	29.43	41.9	45.9	44.4	44.1	56	35	49.0	40.3	39	43	41	41	90	92	88	90	8.26	1.04
A ..	29.754	30.20	29.19	45.9	50.4	48.0	48.1	64	38	53.5	43.8	42	46	43	44	88	86	84	86	5.44	1.53
M .	29.823	30.14	29.51	49.3	55.0	51.9	52.1	65	40	57.3	47.2	45	47	45	46	87	76	79	81	3.43	0.93
J ..	29.844	30.02	29.62	53.5	58.6	56.3	56.1	66	48	60.8	51.9	49	51	48	49	84	78	77	80	2.67	0.97
J ..	29.794	29.98	29.49	56.8	61.3	58.8	59.0	73	53	63.5	55.2	52	53	52	52	85	76	79	80	3.33	1.39
A .	29.808	29.97	29.63	57.7	61.3	59.6	59.5	69	55	63.7	56.4	51	51	50	51	80	70	71	74	1.07	0.44
S ..	29.804	30.10	29.48	57.0	60.2	57.8	58.3	85	49	64.1	53.9	51	54	52	52	84	81	84	83	3.14	1.18
O .	29.833	30.08	29.41	50.4	54.6	52.1	52.4	62	40	57.4	48.1	47	50	48	49	89	85	88	88	5.24	1,53
N ..	29.901	30.45	29.29	42.8	47.7	46.2	45.6	57	35	50.2	40.9	39	42	42	41	87	84	89	86	4.47	1.31
D .	29.731	30.21	29.39	45.8	48.8	47.8	47.5	58	37	51.3	43.6	44	46	45	45	94	92	92	92	17.35	2 58
Y	29.817	30.45	28.92	48.7	52.7	50.9	50.8	85	21	55.4	46.8	45	47	46	46	88	83	84	85	65.50	....

Monthly and yearly meteorological summaries—Continued.

FORT BIDWELL, CAL.

[H=4,615. T=14. h=4.]

Cloudiness (in tenths). 7 a.m.	3 p.m.	11 p.m.	Mean.	Wind. Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days. Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
5.5	7.0	5.2	5.9	3,736	28	S.	S., W.	4	0	1	1	32	14	32	4	5	7	11	13	0	20	7	25	0	0	0	J.
3.9	4.4	2.9	3.7	3,097	28	W.	W.	1	2	1	2	18	4	44	8	4	13	12	3	0	10	0	16	0	0	0	F.
5.3	5.9	3.8	5.0	4,143	23	SW.	W.	20	3	1	0	16	13	29	9	2	10	12	9	0	10	0	25	0	0	1	M.
5.9	5.6	4.9	5.5	4,086	24	SW.	W.	6	1	1	3	25	15	26	13	0	12	6	12	0	14	0	13	0	0	0	A.
4.5	4.9	4.4	4.6	3,968	20	W.	W.	5	1	0	0	21	15	46	4	1	12	10	9	0	10	0	4	0	1	0	M.
2.1	3.0	2.7	2.6	3,962	20	W.	W.	4	1	1	2	17	10	45	10	0	19	7	4	0	6	0	0	0	3	0	J.
1.2	2.4	3.5	2.4	3,768	26	SW.	W.	5	0	2	2	20	2	55	7	0	19	10	2	0	6	0	0	6	5	0	J.
0.6	1.0	1.6	1.2	3,404	22	W.	W.	1	1	3	10	13	1	44	18	2	26	5	0	0	1	0	0	3	2	0	A.
0.9	1.1	0.7	0.9	3,159	18	W., SW	N.	34	1	1	0	6	8	22	18	0	27	3	0	0	0	0	1	0	0	0	S.
4.9	6.4	3.7	5.0	3,101	28	SW.	W.	10	5	4	1	16	9	27	19	2	11	13	7	0	9	0	12	0	0	0	O.
3.0	4.0	2.6	3.2	2,927	28	W.	W.	7	5	5	0	19	2	34	17	1	19	5	6	0	5	1	28	0	0	0	N.
7.1	7.5	5.4	6.7	4,742	30	W.	W.	2	1	5	2	19	24	28	12	0	4	10	17	0	17	0	21	0	0	0	D.
3.7	4.5	3.4	3.9	44,093	...	....	W.	90	21	25	23	222	117	432	139	17	179	104	82	0	108	8	145	9	9	1	Y.

FORT BRIDGER, WYO.

[H=6,643. T=17. h=1.]

Cloudiness (in tenths). 7 a.m.	3 p.m.	11 p.m.	Mean.	Wind. Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days. Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
5.1	5.5	3.9	4.8	9,350	40	SW.	SW.	2	5	1	2	4	54	18	5	2	11	12	8	0	11	16	31	0	1	0	J.
3.5	4.0	2.2	3.2	7,182	39	W.	SW.	1	4	4	3	1	47	21	3	0	11	16	1	0	2	4	28	0	0	0	F.
4.0	5.5	4.2	4.6	8,153	40	SW.	SW.	3	4	2	2	6	48	22	6	0	9	17	5	0	10	6	31	0	0	0	M.
6.8	7.5	4.0	6.1	7,457	46	SW.	SW.	4	4	6	1	5	39	18	13	0	3	18	9	0	9	0	24	0	0	0	A.
4.3	5.4	1.5	3.7	6,314	38	SW.	SW.	5	4	3	3	14	40	16	8	0	14	13	4	0	2	0	12	0	0	0	M.
2.3	5.5	3.7	3.8	5,214	36	W.	SW.	3	5	2	1	12	41	19	6	1	12	15	3	0	10	0	1	0	2	0	J.
2.5	4.7	3.9	3.7	4,967	32	SW.	SW.	3	9	3	7	16	31	13	11	0	11	17	3	0	3	0	0	0	0	1	J.
3.8	5.1	3.0	4.0	4,549	32	W.	SW.	1	6	2	6	10	38	20	10	0	13	10	8	0	10	0	0	0	0	0	A.
1.4	3.2	1.1	1.9	6,666	39	NW.	SW.	1	1	0	2	14	34	24	14	0	22	8	0	0	2	0	8	0	0	0	S.
3.6	5.5	3.3	4.1	5,184	33	N.	SW.	4	8	6	3	15	42	9	6	0	10	18	3	0	10	0	22	0	0	0	O.
3.5	5.4	3.5	4.1	8,087	40	SW.	SW.	2	4	1	3	3	50	21	4	2	14	9	7	0	8	16	28	0	0	0	N.
4.3	6.4	3.9	4.9	9,640	40	NW., W	W.	0	7	0	4	1	32	42	7	0	5	23	3	0	5	4	31	0	0	0	D.
3.8	5.3	3.2	4.1	82,763	...	....	SW.	29	61	30	37	101	496	243	93	5	135	176	54	0	82	46	216	0	3	1	Y.

FORT BUFORD, DAK.

[H=1,854. T=17. h=1.]

Cloudiness (in tenths). 7 a.m.	3 p.m.	11 p.m.	Mean.	Wind. Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days. Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
4.5	6.7	5.8	5.7	6,061	40	NW.	NW.	5	15	8	4	11	5	17	22	6	3	21	7	0	10	28	31	0	0	0	J.
5.9	7.6	5.4	6.3	6,811	46	NW.	NE.	5	17	12	1	16	5	11	16	1	2	16	10	0	12	12	28	0	0	2	F.
7.1	7.1	5.5	6.6	6,881	52	W.	W.	7	20	9	6	9	6	23	11	2	4	16	11	0	11	10	30	0	0	4	M.
4.9	4.9	3.6	4.5	7,303	36	NW.	SE.	7	18	13	19	8	1	9	13	2	12	11	7	0	6	1	13	0	2	2	A.
5.5	5.7	5.0	5.4	7,698	46	W.	W.	9	12	11	9	7	5	21	19	0	5	17	9	0	7	0	2	0	4	0	M.
5.1	6.5	5.5	5.7	5,836	36	W.	SE.	9	12	11	15	13	6	13	11	0	4	17	9	0	7	0	0	5	7	3	J.
5.4	3.9	5.1	4.8	6,596	48	W.	NE.	10	24	13	12	7	6	11	9	1	5	24	2	0	3	0	0	19	5	1	J.
5.3	3.2	2.6	3.7	6,228	40	W.	NE.	8	22	19	8	8	5	9	13	1	11	17	3	0	4	0	0	11	5	1	A.
5.2	4.9	2.7	4.3	7,944	48	W.	W.	5	7	11	3	8	4	33	18	1	9	18	3	0	4	0	6	0	0	1	S.
4.3	5.5	4.4	4.7	5,383	30	NW.	S.	11	15	9	5	18	6	10	15	4	9	14	8	0	6	1	13	0	0	2	O.
4.5	6.5	4.0	5.0	6,724	52	NW.	W.	4	5	6	0	15	9	29	17	5	7	19	4	0	7	8	30	0	0	2	N.
5.6	6.9	5.2	5.9	5,963	50	W.	W.	9	19	11	1	9	9	21	12	2	6	18	7	0	12	23	31	0	0	2	D.
5.3	5.8	4.6	5.2	79,428	...	....	W.	89	186	133	83	129	67	207	176	25	77	208	80	0	89	83	184	35	23	20	Y.

FORT CANBY, WASH.

[H=179. T=7. h=1.]

Cloudiness (in tenths). 7 a.m.	3 p.m.	11 p.m.	Mean.	Wind. Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days. Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
5.6	6.4	6.0	6.0	11,838	68	SW.	SE.	2	1	9	45	5	20	11	0	0	6	14	11	1	21	3	7	0	0	0	J.
6.3	6.1	4.8	5.7	7,700	64	SW.	SW.	2	2	2	20	19	28	9	2	0	9	7	12	2	12	0	0	0	0	0	F.
7.1	7.7	5.9	6.9	8,464	46	SW.	SW.	2	0	1	10	18	44	13	1	4	5	10	16	0	20	0	0	0	0	0	M.
7.1	7.0	6.4	6.8	7,101	44	SE.	W.	7	4	1	9	20	19	25	3	2	3	14	13	0	21	0	0	0	0	0	A.
7.7	5.3	5.1	6.0	7,472	36	S.	W.	19	0	2	4	19	17	29	2	1	6	13	12	0	16	0	0	0	0	0	M.
9.0	6.8	6.3	7.4	4,883	32	S.	W.	16	1	1	0	16	9	42	5	0	2	10	18	0	9	0	0	0	0	0	J.
7.6	6.0	5.8	6.5	6,581	42	SW.	W.	18	5	1	0	20	12	29	7	1	6	8	17	0	12	0	0	0	0	0	J.
7.5	6.0	5.6	6.4	6,089	42	SW.	SW.	21	12	0	0	10	23	18	9	0	6	10	15	0	8	0	0	0	0	0	A.
3.7	4.9	4.3	4.3	7,335	42	S.	S., W.	15	5	0	3	23	12	23	8	1	14	8	8	1	10	0	0	0	0	0	S.
3.2	5.9	5.2	4.8	6,721	50	S.	S.	2	0	0	15	31	19	22	0	4	11	11	9	0	15	0	0	0	0	0	O.
5.0	5.7	4.5	5.1	7,477	48	S.	SE.	13	0	2	26	19	14	13	1	2	9	12	9	0	13	0	0	0	0	0	N.
9.1	9.0	8.7	8.9	13,373	58	S.	SE.	0	0	0	32	25	28	5	2	1	0	7	24	0	28	0	0	0	1	0	D.
6.6	6.4	5.7	6.2	95,034	...	....	SW.	117	30	19	164	225	245	239	40	16	77	124	164	4	185	3	7	0	1	0	Y.

Monthly and yearly meteorological summaries—Continued.

FORT CUSTER, MONT.

[Latitude, 45° 42′ N.; longitude, 107° 34′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J ..	26.870	27.46	26.34	−2.4	8.3	0.6	2.2	52	—38	14.4	—11.8	—6	2	—4	—3	83	76	83	80	.50	.13
F ..	26.815	27.08	26.27	24.6	36.2	29.7	30.2	62	— 5	44.6	20.3	21	27	24	24	86	74	80	80	.74	.21
M .	26.782	27.14	26.16	24.5	38.2	31.3	31.3	71	— 4	43.5	21.7	20	24	24	23	83	61	77	74	.36	.09
A ..	26.715	27.25	26.24	36.6	55.7	46.0	46.1	77	19	60.4	33.7	30	30	31	30	78	41	60	60	1.98	.75
M .	26.815	27.10	26.49	46.5	69.9	58.5	58.3	96	28	75.0	44.1	37	36	39	38	72	33	52	52	.56	.29
J ..	26.827	27.16	26.58	54.4	75.8	65.6	65.3	95	42	82.1	51.5	47	46	47	47	76	40	53	56	2.90	.87
J ..	26.829	26.97	26.54	62.7	87.5	76.7	75.6	106	47	94.2	60.0	52	54	53	53	70	34	47	50	1.59	.99
A ..	26.815	27.10	26.54	59.6	82.9	72.8	71.8	105	37	89.9	56.2	48	55	52	52	68	40	49	52	.71	.44
S ..	26.842	27.14	26.44	44.2	67.3	56.6	56.0	89	30	72.7	40.9	38	42	41	40	80	44	58	61	.66	.28
O ..	26.865	27.30	26.55	38.3	56.0	45.6	46.6	85	24	59.1	34.9	32	34	34	33	80	50	68	66	1.63	.65
N ..	26.894	27.32	26.48	25.6	37.4	30.0	31.0	62	—10	43.0	20.1	21	23	22	22	84	61	76	74	.36	.14
D ..	26.870	27.30	26.51	21.3	28.6	22.3	24.1	59	—13	32.9	16.0	17	18	17	17	84	69	81	78	1.26	.46
Y ..	26.828	27.46	26.16	36.3	53.6	44.6	44.8	106	—38	59.3	32.3	30	33	32	31	79	52	66	65	13.25	....

FORT DAVIS, TEX.

[Latitude, 30° 38′ N.; longitude, 103° 56′ W.]

J ..	25.146	25.37	24.79	34.5	53.1	40.9	42.8	73	—3	56.4	30.0	22	20	20	21	62	31	48	47	.22	.11
F ..	25.207	25.48	24.85	36.2	59.0	46.8	47.3	76	18	63.1	33.2	21	22	23	22	57	29	44	43	.39	.20
M .	25.115	25.37	24.86	41.6	63.7	52.4	52.6	81	23	66.9	39.4	23	18	20	20	50	20	34	35	.26	.23
A ..	25.096	25.35	24.90	48.2	71.6	59.6	59.8	84	24	75.5	45.6	30	25	27	27	52	21	33	35	.10	.05
M .	25.203	25.38	25.01	61.5	85.1	71.9	72.8	98	42	89.5	56.8	31	26	33	30	37	14	28	26	.17	.13
J ..	25.186	25.35	25.03	64.6	83.5	72.8	73.6	99	49	88.9	60.6	49	45	48	47	61	31	45	46	2.18	.96
J ..	25.218	25.32	25.08	68.3	85.3	74.6	76.1	102	55	91.3	66.1	54	50	54	53	63	33	51	49	1.28	.63
A ..	25.227	25.35	25.13	68.0	84.7	73.9	75.5	96	59	90.4	65.1	53	50	52	52	60	33	48	47	1.97	.97
S ..	25.227	25.45	25.08	61.0	77.7	66.4	68.4	91	39	82.2	58.9	54	51	54	53	79	42	67	63	5.33	2.71
O ..	25.263	25.55	25.06	55.1	74.2	60.7	63.3	83	43	77.1	52.0	45	43	46	45	70	36	61	56	.71	.68
N ..	25.231	25.56	24.82	40.4	61.1	46.8	49.4	81	17	63.6	37.2	22	19	24	22	50	24	42	38	.03	.01
D ..	25.245	25.52	24.98	41.5	60.9	47.4	49.9	74	18	64.3	37.4	17	13	18	16	41	18	32	30	.00	.00
Y ..	25.198	25.57	24.79	51.7	71.7	59.5	61.0	102	3	75.8	48.5	35	32	35	34	57	28	44	43	12.64	....

FORT ELLIOTT, TEX.

[Latitude, 35° 30′ N.; longitude, 100° 21′ W.]

J ..	27.247	27.59	26.88	19.1	33.9	22.7	25.2	60	—10	39.1	14.3	16	22	18	19	86	66	84	79	.62	.30
F ..	27.270	27.62	26.72	31.9	50.9	36.9	39.9	74	5	54.0	26.8	26	31	30	29	80	50	78	69	1.44	1.07
M	27.179	27.45	26.74	35.7	54.8	42.2	44.2	84	14	57.6	33.7	30	30	33	31	81	47	72	67	1.49	.81
A ..	27.175	27.56	26.82	43.9	64.6	53.1	53.9	79	20	67.2	42.4	37	40	40	39	77	45	64	62	2.44	1.06
M .	27.208	27.46	26.88	59.1	82.0	68.1	69.7	96	43	84.2	56.1	48	45	50	48	70	31	55	52	.23	.21
J ..	27.230	27.53	27.00	64.2	81.7	70.8	72.2	95	49	84.0	61.9	58	58	59	58	81	46	68	65	3.45	1.79
J ..	27.240	27.37	27.09	68.7	90.6	77.6	79.0	102	60	92.7	65.9	61	61	62	61	77	38	59	58	1.50	.90
A ..	27.257	27.38	27.14	68.6	86.8	76.2	77.2	99	59	89.5	66.6	62	61	63	62	81	45	66	64	4.57	1.74
S ..	......	....	.....	...	....	..	...	....	....	......	......	...	....	....	....	...	...	...	...	...	...
O ..	27.331	27.76	26.92	50.8	68.6	56.9	58.8	83	33	70.8	49.5	47	50	50	49	86	55	78	73	5.04	2.97
N ..	27.286	27.70	26.86	34.7	54.2	39.4	42.8	74	10	57.6	31.3	27	30	30	29	75	42	70	62	.18	.15
D ..	27.297	27.73	26.94	25.9	46.0	30.2	34.0	71	2	49.6	21.3	19	24	22	22	77	45	71	64	.09	.09
Y ..	......	....	.....	....	....	...	....	....	....	......	......	....	....	....	....	...	...	...	...	.....	....

FORT GRANT, ARIZ.

[Latitude, 32° 39′ N.; longitude, 109° 57′ W.]

J ..	25.216	25.39	24.81	34.2	47.3	41.4	41.0	65	12	51.6	33.2	25	29	30	28	70	54	65	63	2.46	1.12
F ..	25.242	25.52	24.99	41.2	57.8	50.4	49.8	72	29	61.5	40.4	24	25	25	25	52	32	41	41	1.29	.97
M .	25.162	25.38	24.92	39.4	55.7	47.3	47.5	77	28	60.2	37.9	22	24	26	24	51	30	47	43	.53	.29
A ..	25.139	25.29	24.91	44.6	64.7	56.6	55.3	80	32	68.7	44.0	25	29	28	28	47	28	37	37	.30	.30
M .	25.207	25.34	25.10	57.8	78.4	67.6	67.9	89	40	79.4	56.6	30	35	33	33	36	23	28	29	.04	.04
J ..	25.240	25.38	25.09	62.5	79.8	72.4	71.6	92	49	85.8	62.0	36	41	39	39	39	27	32	33	.73	.32
J ..	25.269	25.38	25.12	68.9	85.3	78.9	77.7	100	62	91.2	68.2	42	51	51	48	40	33	41	38	.92	.36
A ..	25.251	25.38	25.14	67.7	83.1	74.4	75.1	98	58	88.6	66.2	60	63	62	62	76	53	68	66	3.40	.91
S ..	25.231	25.40	25.13	63.0	76.7	68.6	69.4	87	52	80.5	60.6	49	49	47	48	63	42	51	52	3.49	1.12
O ..	25.268	25.46	25.10	54.0	69.2	60.3	61.2	80	39	72.9	51.9	36	35	35	35	52	29	41	41	.57	.50
N ..	25.278	25.53	24.91	41.2	55.9	47.7	48.3	72	21	60.0	38.0	26	26	24	25	58	34	42	45	.10	.10
D ..	25.309	25.52	25.11	42.9	59.0	50.4	50.8	70	32	63.3	41.3	23	25	23	24	46	29	34	86	.09	.09
Y ..	25.234	25.53	24.81	51.4	67.7	59.7	59.6	100	12	72.0	50.0	33	36	35	35	53	34	44	41	13.92	....

Monthly and yearly meteorological summaries—Continued.

FORT CUSTER, MONT.

[H=3,040. T=19. h=24.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and years.
4.8	5.4	3.9	4.7	......	..	....	SE.	19	8	3	22	4	10	11	5	3	9	10	9	0	12	20	29	0	0	0	J.
6.1	7.6	4.0	5.9	3,925	.	....	N.	23	5	2	20	4	16	4	9	1	6	13	9	0	12	5	27	0	0	0	F.
5.0	7.5	5.2	5.9	5,628	35	NW.	SW.	19	3	4	10	6	22	15	11	3	5	17	9	0	13	6	27	0	0	0	M.
5.2	6.5	3.4	5.0	5,852	36	N.	SE.	22	4	5	27	9	9	7	5	2	8	17	5	0	7	0	11	0	2	0	A.
5.0	5.9	5.4	5.4	5,020	36	N., NW.	SE.	16	4	4	24	10	14	6	9	6	4	21	6	0	7	0	3	2	5	0	M.
4.8	5.5	5.2	5.2	4,413	44	N.	SE.	16	2	6	34	2	8	7	6	9	5	20	5	0	9	0	0	7	7	0	J.
3.9	3.4	5.3	4.2	4,521	39	W.	N.	25	4	4	24	9	9	10	5	3	8	19	4	0	5	0	0	22	8	0	J.
3.2	2.5	2.1	2.6	4,155	32	N.	SE.	20	6	4	24	9	11	9	5	5	17	14	0	0	4	0	0	16	5	0	A.
3.3	3.7	2.8	3.3	4,715	31	N.	N.	22	6	3	18	13	14	7	5	1	15	9	5	0	6	0	2	0	0	0	S.
4.5	5.4	4.4	4.8	4,508	37	N.	N.	23	8	3	19	13	11	8	8	0	10	14	7	0	9	0	13	0	0	1	O.
5.4	5.7	4.0	5.0	5,319	41	NW.	SE.	15	10	1	19	6	12	14	11	1	9	12	8	0	8	7	27	0	0	0	N.
5.7	7.4	5.5	6.2	5,281	38	NW.	N.	26	6	1	14	7	14	8	16	1	4	16	11	0	9	12	27	0	0	0	D.
4.7	5.5	4.3	4.8	......	..	....	SE.	246	66	40	255	92	150	106	95	35	100	182	78	0	101	50	166	47	27	1	Y.

FORT DAVIS, TEX.

[H=4,928. T=16. h=2.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and years.
1.0	2.9	1.4	1.8	6,485	32	SW.	SW.	12	10	3	1	8	47	3	1	8	25	5	1	0	4	1	15	0	0	0	J.
2.8	3.1	1.1	2.3	4,791	30	SW.	SW.	6	19	3	4	5	33	7	2	5	20	4	4	0	2	0	11	0	0	0	F.
1.6	3.4	1.4	2.1	6,244	32	SW.	SW.	7	11	2	2	4	51	10	2	4	21	9	1	0	3	0	7	0	0	0	M.
1.6	2.2	0.5	1.4	5,893	38	SW.	SW.	0	10	10	6	9	40	6	3	6	23	7	0	0	3	0	1	0	1	0	A.
1.5	2.8	0.9	1.7	5,622	28	NE., SW.	NE.	8	28	7	3	6	25	5	5	6	22	9	0	0	3	0	0	17	2	0	M.
2.5	5.6	2.1	3.4	4,828	56	NE.	NE.	5	34	3	4	6	21	8	3	6	15	12	3	0	9	0	0	15	3	0	J.
2.6	5.2	1.5	3.1	4,209	28	SW.	NE.	7	22	10	16	5	20	4	5	4	17	14	0	0	7	0	0	18	4	0	J.
2.3	5.0	3.2	3.5	4,313	31	NE.	NE.	0	22	16	10	9	20	5	8	3	15	13	3	0	7	0	0	17	4	0	A.
3.0	5.3	2.4	3.6	3,930	22	NE.	NE.	4	21	10	13	4	18	12	4	4	13	16	1	0	9	0	0	1	3	0	S.
2.0	2.4	1.1	1.8	4,323	20	SW., NE.,	SW.	0	10	7	5	7	47	4	3	10	23	6	2	0	2	0	0	0	2	0	O.
2.7	2.2	1.8	2.2	5,722	38	SW.	SW.	4	22	1	5	7	37	2	3	9	20	6	4	0	3	0	9	0	0	0	N.
1.3	2.3	1.1	1.6	6,038	38	N.	SW.	6	14	2	5	9	48	4	2	3	23	7	1	0	0	0	8	0	0	0	D.
2.1	3.5	1.5	2.4	62,398	..	....	SW.	59	223	74	74	79	407	70	41	68	237	108	20	0	52	1	51	68	19	0	Y.

FORT ELLIOTT, TEX.

[H=2,700. T=7. h=1.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and years.
3.1	5.0	2.8	3.6	10,037	59	N.	NW.	14	0	1	18	14	5	1	36	4	17	9	5	1	6	9	30	0	0	0	J.
3.7	3.8	2.9	3.5	8,462	45	NW.	NW.	4	1	4	10	14	13	2	35	1	13	11	4	0	5	2	20	0	2	0	F.
4.5	4.1	2.5	3.7	11,324	48	SE. NW	NW.	11	3	6	21	4	16	3	29	0	14	13	4	0	8	1	10	0	0	0	M.
3.8	3.7	3.1	3.5	11,106	50	SE.	SE.	7	2	6	29	13	12	1	19	1	13	13	4	0	7	0	6	0	3	0	A.
3.4	2.9	2.4	2.9	7,855	49	NW,	SE.	15	8	3	22	10	13	7	9	6	18	10	3	0	3	0	0	11	2	0	M.
5.0	3.5	3.4	4.0	7,784	46	NE.	SE.	15	9	14	25	14	3	1	4	5	13	13	4	0	9	0	0	5	8	0	J.
3.5	3.7	2.3	3.2	6,917	64	NW.	SE.	17	7	8	35	11	6	1	4	4	18	9	4	0	6	0	0	23	5	0	J.
3.0	2.8	1.4	2.4	6,443	40	NW.	SE..	10	5	6	28	17	15	0	4	8	22	6	3	0	5	0	0	15	4	0	A.
...	...	...	...	7,703	..	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	S.
4.9	3.9	2.3	3.7	8,085	36	SE.	SE.	9	0	4	26	24	8	3	6	7	13	12	4	0	6	0	0	0	2	0	O.
1.7	3.6	2.4	2.6	7,762	50	NW.	NW.	18	1	2	8	7	17	4	22	11	18	11	1	0	2	0	16	0	0	0	N.
1.3	4.4	1.2	2.3	8,231	52	NW.	NW.	15	2	1	15	8	7	5	30	10	18	13	0	0	1	2	28	0	0	0	D.
...	...	...	...	101,709	..	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Y.

FORT GRANT, ARIZ.

[H=4,910. T=14. h=1.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and years.
3.9	3.8	3.4	3.7	4,974	37	SE.	N.	21	5	2	18	13	7	11	15	1	17	5	9	0	12	2	12	0	0	0	J.
2.1	2.9	1.8	2.3	5,371	40	N.	N.	25	8	2	23	5	3	9	8	1	19	7	2	0	6	0	1	0	0	0	F.
0.8	3.2	1.8	1.9	6,149	34	W.	N.	30	4	0	6	8	3	22	19	1	23	8	0	0	5	0	6	0	0	0	M.
0.7	1.0	1.0	0.9	5,806	33	SE.	W.	20	5	6	4	10	9	28	8	0	28	2	0	0	1	0	1	0	0	0	A.
2.1	2.6	1.4	2.0	5,644	32	SW.	N.	19	6	15	4	5	12	13	16	3	22	7	2	0	1	0	0	0	0	0	M.
2.0	3.0	2.2	2.4	5,038	35	SE.	W.	12	8	2	10	13	13	21	11	0	19	9	2	0	8	0	0	9	1	0	J.
1.9	3.6	5.1	3.5	4,647	36	SE., W.	NW.	10	6	2	9	15	7	18	25	1	14	14	3	0	11	0	0	20	5	0	J.
3.4	4.7	5.2	4.4	5,157	44	SE.	NE.	7	24	16	5	2	17	13	8	1	7	23	1	0	13	0	0	12	9	0	A.
2.0	3.3	2.0	2.4	5,335	40	E.	N., E.	19	17	19	9	8	8	5	5	0	19	9	2	0	10	0	0	0	9	0	S.
1.2	2.1	1.4	1.6	5,462	36	E.	E.	18	14	19	9	5	11	7	10	0	24	6	1	0	3	0	0	0	3	0	O.
1.9	2.7	2.2	2.3	5,266	40	E.	E.	11	17	21	7	9	9	8	8	0	21	5	4	0	2	0	8	0	0	0	N.
2.8	2.6	1.8	2.4	4,903	28	E., W.	NE.	4	32	13	5	10	10	11	7	1	19	10	2	0	1	0	0	0	0	0	D.
2.1	3.0	2.4	2.5	63,752	..	....	N.	196	146	117	109	103	109	166	140	9	232	105	28	0	73	2	28	41	27	0	Y.

Monthly and yearly meteorological summaries—Continued.

FORT MACON, N. C.

[Latitude, 34° 42′ N.; longitude, 76° 40′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J	30.040	30.71	29.27	36.6	43.7	38.9	39.7	63	10	46.5	34.0	33	39	35	36	86	84	87	86	4.86	1.93
F	30.117	30.59	29.55	39.3	47.5	42.0	42.9	65	11	50.3	36.1	34	41	38	38	83	79	86	82	2.34	.86
M	30.008	30.31	29.44	45.9	53.2	48.9	49.3	64	29	55.1	43.2	42	47	45	45	88	81	88	86	4.64	1.33
A	30.068	30.38	29.53	57.9	64.6	59.4	60.6	72	40	66.7	55.8	55	58	56	57	90	81	90	87	2.89	1.29
M	29.966	30.31	29.52	66.4	71.3	66.6	68.1	79	47	73.0	62.8	61	63	62	62	82	77	85	81	2.33	.98
J	29.979	30.19	29.75	74.0	77.9	73.8	75.2	84	60	79.6	70.4	70	73	71	71	88	85	90	87	6.52	3.37
J	29.958	30.16	29.78	77.1	81.7	78.0	78.9	87	68	83.2	74.0	74	77	75	75	91	85	90	88	9.70	6.49
A	29.987	30.30	29.62	75.7	78.8	75.0	76.5	86	65	81.4	72.5	72	73	72	72	89	84	89	87	7.08	1.50
S	30.114	30.30	29.86	72.3	78.6	73.4	74.8	84	63	80.0	70.2	68	71	69	69	87	77	87	84	1.70	1.19
O	30.159	30.42	29.88	60.6	70.2	63.6	64.8	81	42	71.7	59.3	57	59	58	58	88	68	84	80	.60	.50
N	30.125	30.38	29.72	51.7	60.1	53.7	55.2	79	31	62.2	45.0	45	47	46	46	78	64	75	72	1.17	.57
D	30.147	30.53	29.58	42.2	49.2	44.3	45.2	65	25	52.8	37.3	36	41	39	39	80	74	83	79	3.67	1.15
Y	30.056	30.71	29.27	58.3	64.7	59.8	60.9	87	10	66.9	55.0	54	58	56	56	86	78	86	83	47.50	....

FORT MAGINNIS, MONT.

[Latitude, 47° 12′ N.; longitude, 109° 10′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
J	25.439	25.80	25.00	1.8	16.5	9.9	9.4	50	—33	20.9	—2.1	— 9	1	— 2	— 4	62	50	57	57	2.40	.59
F	25.450	25.70	25.07	24.6	38.5	31.7	31.6	65	— 9	44.1	22.7	15	23	22	20	67	55	67	63	1.92	.39
M	25.432	25.79	24.87	24.0	35.3	27.9	29.1	58	— 3	38.7	20.7	15	22	18	18	68	60	67	65	2.25	.47
A	25.430	25.90	24.99	32.5	50.9	39.8	41.1	73	16	54.7	31.1	21	33	28	27	63	53	62	59	1.18	.40
M	25.544	25.82	25.20	43.6	64.9	51.7	53.4	92	23	67.8	41.8	31	46	38	38	62	50	60	57	.54	.08
J	25.583	25.89	25.36	51.2	70.3	57.9	59.8	89	36	74.1	49.3	39	51	45	45	64	53	63	60	2.55	1.06
J	25.605	25.75	25.38	60.2	83.0	69.1	70.8	104	47	86.6	58.7	44	58	53	52	56	43	57	52	.34	.11
A	25.594	25.85	25.37	55.7	78.1	63.5	65.8	95	37	81.1	53.8	42	54	48	48	60	44	57	54	.79	.35
S	25.578	25.83	25.24	43.7	60.6	48.8	51.0	83	27	64.8	40.1	32	37	35	34	64	44	60	56	1.17	.84
O	25.584	25.92	25.28	39.1	52.8	41.8	44.6	80	23	56.9	36.5	30	30	30	30	69	46	63	60	.19	.06
N	25.553	26.00	25.18	25.2	35.2	29.7	30.0	63	—14	41.9	21.8	18	19	20	19	74	54	68	66	1.67	.70
D	25.510	25.86	25.18	20.6	27.6	22.7	23.6	56	—22	34.1	14.7	12	13	14	13	70	56	69	65	.44	.09
Y	25.525	26.00	24.87	35.2	51.1	41.2	42.5	104	—33	55.5	32.4	23	32	29	28	65	51	63	60	15.44	....

FORT SHAW, MONT.

[Latitude, 47° 31′ N.; longitude, 111° 48′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
J	26.326	26.80	25.82	0.2	13.8	8.6	7.5	51	—41	20.4	—4.5	—24	—10	— 8	—14	43	51	59	51	.85	.23
F	26.289	26.56	25.86	28.5	42.9	33.6	35.0	66	—21	48.1	23.6	15	20	18	18	59	45	55	53	1.04	.81
M	26.258	26.72	25.73	25.5	39.4	30.4	31.8	69	—18	45.0	20.7	16	27	19	21	67	63	64	64	.55	.26
A	26.236	26.75	25.78	37.3	54.7	43.6	45.2	75	19	60.0	33.9	26	37	29	31	66	55	59	60	2.30	.67
M	26.333	26.59	26.01	44.2	66.1	55.1	55.1	94	27	72.4	41.7	32	48	41	40	64	54	61	60	.63	.24
J	26.358	26.71	26.19	49.2	72.5	62.0	61.2	90	35	79.3	47.7	39	54	52	49	70	58	72	66	1.64	.30
J	26.360	26.54	26.18	56.9	82.8	72.5	70.7	106	44	89.1	55.2	45	57	56	53	66	45	59	57	.82	.27
A	26.349	26.67	26.12	51.9	78.8	69.1	66.6	94	36	84.5	49.7	39	50	54	48	63	40	60	54	.19	.08
S	26.360	26.64	25.96	43.1	63.2	52.1	52.8	82	32	68.4	41.4	32	44	39	38	67	53	63	61	1.11	.52
O	26.380	26.70	26.11	38.8	54.8	45.7	46.4	84	23	60.3	36.6	31	38	34	34	74	57	66	65	.94	.29
N	......	.....	.....	....	....	.....	.....	....	....	.....	.....	....	....	....	....	...	...	...	...	.....	....
D	......	.....	.....	....	....	.....	.....	....	....	.....	.....	....	....	....	....	...	...	...	...	.....	....
Y	......	.....	.....	....	....	.....	.....	....	....	.....	.....	....	....	....	....	...	...	...	...	.....	....

FORT SILL, IND. T.

[Latitude, 34° 40′ N.; longitude, 98° 23′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
J	28.872	29.36	28.47	20.6	34.6	26.4	27.2	68	— 5	40.4	17.8	18	14	22	18	74	63	76	71	.42	.18
F	28.857	29.33	28.26	30.0	52.2	40.1	40.8	75	5	55.9	28.4	22	31	30	28	72	48	69	63	.49	.18
M	28.741	29.06	28.29	39.1	58.5	48.6	48.7	88	23	62.8	37.6	30	34	34	33	72	48	61	60	1.46	.67
A	28.723	29.14	28.35	49.8	70.7	58.5	59.7	84	27	73.1	48.1	43	40	43	42	78	36	59	58	1.60	.70
M	28.705	28.99	28.38	64.6	87.5	74.6	75.6	103	47	90.1	61.4	54	50	53	52	71	30	49	50	.07	.07
J	28.713	28.96	28.50	69.3	84.8	76.2	76.8	103	52	88.5	66.5	62	59	62	61	70	45	64	63	1.08	.85
J	28.705	28.84	28.52	76.3	94.5	84.0	84.9	106	67	97.2	73.6	64	61	65	64	68	35	55	53	.84	.30
A	28.732	28.87	28.60	72.9	92.1	82.7	82.6	104	62	95.1	71.3	64	62	64	63	73	39	54	56	3.40	1.53
S	28.780	29.11	28.43	68.5	83.8	75.8	76.0	94	50	86.5	67.0	61	61	61	61	79	49	62	63	2.62	1.56
O	28.899	29.30	28.45	54.4	72.3	61.1	62.6	83	35	74.4	52.2	51	52	52	52	88	52	74	71	7.10	3.63
N	28.857	29.34	28.36	39.9	57.8	46.9	48.2	77	19	60.1	37.4	33	29	33	32	78	36	60	58	.47	.40
D	28.903	29.39	28.49	28.8	47.8	35.6	37.4	69	3	49.8	26.2	21	23	23	22	73	40	62	58	.02	.02
Y	28.791	29.39	28.26	51.2	69.7	59.2	60.0	106	— 5	72.8	49.0	44	43	45	44	76	44	62	60	19.57	....

Monthly and yearly meteorological summaries—Continued.

FORT MACON, N. C.

[H=11. T=22. h=5.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.8	5.6	3.8	5.1	12,599	62	SW.	N.	23	22	2	5	3	11	5	22	0	10	12	9	0	14	4	8	0	1	0	J.
4.3	4.0	2.1	3.5	9,790	44	NW.	SW., NW.	13	12	6	6	10	17	2	17	1	14	11	3	0	9	1	8	0	1	0	F.
5.0	4.9	3.2	4.4	11,807	51	SW.	SW.	8	12	2	8	17	26	5	15	0	13	11	7	0	11	0	3	0	1	0	M.
5.3	4.8	3.9	4.7	10,984	48	NE.	SW.	9	20	11	12	9	21	3	5	0	11	11	8	0	10	0	0	0	1	0	A.
4.5	4.1	2.4	3.7	11,758	44	NW., S.	SW.	0	7	6	5	13	44	4	14	0	14	13	4	0	10	0	0	0	3	0	M.
6.0	6.0	4.8	5.6	11,401	47	NE.	SW.	5	17	7	5	13	36	5	2	0	7	13	10	0	12	0	0	0	5	0	J.
6.1	6.1	4.3	5.5	10,673	48	S.	SW.	3	8	6	1	18	50	4	3	0	5	19	7	0	16	0	0	0	6	0	J.
7.1	6.0	4.9	6.0	11,174	56	SE.	SW.	12	12	7	7	18	25	6	0	0	4	17	10	0	17	0	0	0	8	0	A.
4.4	4.0	3.2	3.9	9,665	31	N., NE.	NE.	16	20	9	11	9	18	4	2	1	12	13	5	0	8	0	0	0	3	0	S.
2.4	3.3	1.5	2.4	9,193	36	N.	NE.	19	22	8	4	3	13	7	17	0	21	9	1	0	3	0	0	0	0	0	O.
3.3	3.1	2.2	2.9	8,599	46	NW.	NW.	9	12	2	3	11	21	9	23	0	15	13	2	0	4	0	1	0	1	0	N.
6.8	5.3	4.1	5.4	7,120	34	N.	SW.	25	2	0	0	5	26	12	22	1	9	10	12	0	12	0	8	0	0	0	D.
5.1	4.8	3.4	4.4	124,763	...	....	SW.	142	166	66	67	129	208	66	148	3	135	152	78	0	126	5	28	0	30	0	Y.

FORT MAGINNIS, MONT.

[H=4,320. T=7. h=1.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.9	6.8	5.3	6.3	9,117	56	E.	W.	19	11	9	11	4	1	22	15	1	5	13	13	0	14	17	30	0	0	0	J.
6.9	6.9	6.6	6.8	9,483	78	NW.	W.	15	5	1	4	2	1	35	19	2	2	13	13	0	17	6	20	0	0	0	F.
5.9	7.8	5.3	6.3	6,913	43	W.	W.	17	6	5	7	5	3	28	21	1	6	13	12	0	17	7	26	0	0	0	M.
4.4	5.6	4.1	4.7	8,180	62	NW.	NW.	17	5	9	11	8	4	17	19	0	9	13	8	0	11	0	15	0	1	0	A.
4.9	5.7	4.5	5.0	8,242	44	W.	N.	25	6	2	5	8	3	20	24	0	5	20	6	0	12	0	7	1	1	0	M.
5.6	6.7	5.4	5.9	5,799	28	W.	N.	22	11	6	11	7	1	13	19	0	3	18	9	0	15	0	0	0	4	0	J.
3.0	5.3	6.1	4.8	4,141	33	SE.	SE.	9	20	4	21	10	1	9	13	0	8	17	4	0	9	0	0	10	7	0	J.
3.4	4.2	3.3	3.6	3,944	21	N.	N.	29	6	5	12	6	8	11	16	0	13	15	3	0	6	0	0	1	2	0	A.
4.1	4.4	3.1	3.9	7,192	46	NW.	NW.	11	8	2	7	1	4	4	52	1	13	14	3	0	5	0	3	0	0	0	S.
4.0	4.8	3.8	4.2	7,659	46	NW.	NW.	4	8	3	14	0	2	2	58	2	12	13	6	1	5	0	11	0	0	0	O.
4.9	6.2	4.8	5.3	11,530	52	NW.	NW.	3	3	2	3	0	2	4	73	0	7	15	8	0	11	6	22	0	0	0	N.
6.4	5.8	5.2	5.8	8,860	54	W.	NW.	2	6	0	3	1	7	17	41	16	5	16	10	1	12	13	25	0	0	0	D.
5.0	5.8	4.8	5.2	91,060	...	....	NW.	173	95	48	109	52	37	182	370	23	88	180	95	2	134	49	159	12	15	0	Y.

FORT SHAW, MONT.

[H=3,530. T=7. h=24.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.0	4.7	4.8	4.2	6,712	44	W., SW.	W.	8	6	18	0	1	17	38	2	3	11	17	3	0	12	18	30	0	0	0	J.
3.8	4.2	3.6	3.9	7,276	56	SW.	SW.	2	5	9	0	1	40	23	4	0	11	14	3	0	4	5	20	0	0	0	F.
4.0	5.2	2.7	4.0	5,076	48	NW.	SW.	3	1	17	2	5	35	25	3	2	10	19	2	0	7	5	25	0	0	0	M.
3.7	4.9	4.4	4.3	5,412	32	NW.	W.	7	9	5	6	6	15	30	8	4	11	14	5	0	9	0	12	0	0	0	A.
3.2	4.2	2.6	3.3	4,796	41	SW.	W.	2	5	11	5	1	17	45	3	4	16	14	1	0	5	0	7	3	0	0	M.
4.8	5.2	5.3	5.1	3,151	36	W.	W.	2	9	6	3	3	8	44	10	5	8	15	7	0	16	0	0	0	4	0	J.
2.5	3.3	3.3	3.0	3,303	32	W.	W.	4	6	12	4	1	6	48	2	10	14	15	2	0	8	0	0	14	0	0	J.
2.4	1.8	1.7	2.0	2,517	27	W.	W.	3	8	19	0	0	9	45	9	0	23	7	1	0	4	0	0	9	0	0	A.
4.3	4.2	1.9	3.5	2,195	30	NE.	W.	3	4	4	5	2	10	33	11	18	15	11	4	0	5	0	0	0	0	0	S.
5.4	5.7	4.5	5.2	2,112	29	W.	W.	2	5	6	3	3	8	34	4	10	11	6	10	0	10	0	8	0	0	0	O.
...	...	...	...	....	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	N.
...	...	...	...	....	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	D.
...	...	...	...	....	...	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Y.

FORT SILL, IND. T.

[H=1,200. T=6. h=6.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.0	4.5	3.4	4.0	8,435	49	N.	N.	40	8	1	6	10	2	0	20	6	13	11	7	0	4	7	30	0	0	0	J.
3.1	3.8	1.5	2.8	7,415	39	N.	N.	31	5	0	8	13	11	0	16	0	17	7	4	0	6	2	17	0	0	0	F.
4.5	3.6	2.4	3.5	10,356	52	SE.	N., NE.	19	19	2	11	18	7	3	13	1	17	9	5	0	8	0	6	0	0	0	M.
4.9	3.6	2.8	3.8	9,965	44	S.	S.	14	11	12	6	33	3	1	9	1	14	11	5	0	5	0	4	0	4	0	A.
3.2	2.0	0.9	2.0	7,625	42	SE.	S.	19	7	8	5	44	5	1	4	0	24	6	1	0	1	0	0	16	1	0	M.
3.8	4.4	1.9	3.4	8,479	37	SE.	N.	33	22	3	8	21	2	0	0	1	17	11	2	0	6	0	0	10	2	0	J.
2.8	4.3	1.4	2.8	6,440	32	SE.	S.	21	9	2	11	43	5	0	1	1	18	11	2	0	4	0	0	29	4	1	J.
3.3	4.1	1.9	3.1	6,597	27	S.	S.	20	9	3	9	45	6	0	1	0	16	13	2	0	7	0	0	25	3	0	A.
3.4	5.5	2.8	3.9	7,465	34	NW.	S.	14	8	5	14	38	6	1	3	1	15	10	5	0	7	0	0	13	2	0	S.
2.8	3.3	2.2	2.8	6,951	36	S.	S.	15	6	13	18	20	9	3	2	7	20	7	4	0	7	0	0	0	3	0	O.
3.8	3.3	3.3	3.5	7,657	31	N.	N.	42	1	1	5	24	7	4	6	0	16	9	5	0	3	0	9	0	0	0	N.
2.6	3.1	1.9	2.5	9,058	46	N.	N.	44	7	2	2	8	12	8	8	2	21	6	4	0	1	5	21	0	0	0	D.
3.5	3.8	2.2	3.2	96,443	...	....	S.	312	112	52	103	317	75	21	83	20	208	111	46	0	59	14	87	93	19	1	Y.

Monthly and yearly meteorological summaries—Continued.

FORT SMITH, ARK.

[Latitude, 35° 22′ N.; longitude, 94° 24′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 a. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.622	30.22	29.12	22.7	31.7	26.9	27.1	64	—7	35.5	19.8	18	22	21	20	81	67	77	75	2.52	1.39
F ..	29.621	30.14	29.01	30.3	46.8	38.4	38.5	69	2	49.8	28.4	25	29	30	28	79	54	72	68	2.38	1.46
M .	29.509	29.85	29.04	40.9	54.1	47.4	47.5	82	25	58.4	39.0	35	35	38	36	80	56	72	69	3.02	.66
A ..	29.493	29.86	29.08	51.3	68.3	59.4	59.7	86	30	71.5	49.5	46	47	49	47	84	50	71	68	7.29	2.61
M	29.453	29.77	29.14	63.7	83.4	71.2	72.8	98	48	85.6	60.8	61	65	66	64	91	55	84	77	.38	.24
J ..	29.447	29.70	29.19	68.5	80.8	72.2	73.8	99	59	84.2	66.4	67	69	70	68	94	70	92	85	6.09	2.11
J ..	29.430	29.65	29.21	72.9	88.1	77.9	79.6	103	62	91.5	71.0	68	69	72	70	86	57	82	75	2.63	1.52
A ..	29.452	29.62	29.25	71.5	89.0	76.6	79.0	104	57	91.5	70.4	68	67	71	69	90	51	83	75	1.82	.85
S ..	29.516	29.76	29.24	66.4	83.1	71.9	73.8	98	49	85.9	65.4	63	64	66	64	90	54	81	75	4.22	1.52
O ..	29.657	29.96	29.10	52.3	72.3	59.1	61.2	83	31	74.2	51.6	50	52	55	52	93	52	86	77	1.53	1.12
N ..	29.584	30.06	29.08	39.6	56.7	45.8	47.4	75	22	59.5	37.0	36	38	38	37	88	54	76	73	2.66	1.06
D ..	29.654	30.08	29.30	30.2	42.8	35.4	36.1	64	8	46.3	28.0	25	28	27	27	81	59	73	71	.79	.42
Y ..	29.536	30.22	29.01	50.9	66.4	56.8	58.0	104	—7	69.5	48.9	47	49	50	49	87	56	79	74	35.33	....

FORT SAINT MICHAEL'S, ALASKA.

[Latitude, 63° 28′ N.; longitude, 161° 48′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 a. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	30.061	30.59	29.15	6.8	7.8	8.3	7.6	43	—38	13.4	0.4	3	3	5	4	85	82	86	84	.43	.17
F ..	29.841	30.50	29.07	—3.3	—3.8	—1.5	—2.9	31	—28	3.3	—9.8	—6	—7	—4	—6	88	84	88	87	.34	.08
M .	29.723	30.24	29.12	3.7	5.7	10.2	6.5	39	—27	15.4	—3.0	1	2	7	14	90	86	86	87	.46	.15
A ..	29.926	30.76	29.30	16.8	20.8	25.3	21.0	46	— 9	28.6	9.9	14	16	20	27	87	82	81	83	.12	.04
M .	29.783	30.34	29.12	30.2	33.3	34.4	32.6	46	13	38.1	27.2	27	29	30	8	89	83	82	85	1.53	.36
J ..	29.891	30.25	29.47	39.7	43.6	44.5	42.6	59	29	49.3	36.7	37	38	38	38	91	82	79	84	1.77	.53
J ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
A ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
S ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
O ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
N ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
D ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
Y ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......

FORT STANTON, N. MEX.

[Latitude, 33° 30′ N.; longitude, 105° 26′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 a. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	23.878	24.10	23.50	25.0	42.3	32.8	33.4	61	—4	45.7	21.7	19	21	23	21	78	47	69	65	.36	.20
F ..	23.953	24.28	23.62	27.0	50.6	36.5	38.0	65	9	53.6	25.4	19	23	24	22	73	37	63	58	.17	.13
M .	23.853	24.12	23.51	26.0	51.3	40.2	39.2	70	12	55.1	24.9	18	27	27	24	71	41	62	58	.50	.41
A ..	23.860	24.07	23.65	37.1	59.8	49.1	48.7	73	22	63.0	35.5	26	28	31	28	63	33	51	49	1.50	.98
M .	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
J ..	24.008	24.19	23.81	50.8	76.2	63.1	63.4	91	42	80.3	50.2	37	46	48	44	60	39	60	53	1.61	.33
J ..	24.057	24.19	23.92	56.8	79.0	67.8	67.9	95	49	83.8	56.1	46	55	56	52	67	47	69	61	4.71	1.24
A ..	24.064	24.20	23.87	56.3	75.3	63.9	65.2	86	49	78.9	55.8	48	58	58	55	75	57	81	71	5.45	1.47
S ..	24.049	24.27	23.88	48.9	68.0	55.2	57.4	80	31	71.3	47.7	43	52	51	49	80	61	86	76	4.29	2.01
O ..	24.049	24.34	23.84	38.8	62.9	47.1	49.6	74	26	65.7	37.2	32	42	40	38	75	50	78	68	1.32	.72
N ..	23.976	24.31	23.56	27.4	49.4	35.9	37.6	68	7	52.4	24.9	20	20	23	21	73	37	62	57	.15	.12
D ..	23.995	24.23	23.73	27.2	51.2	35.5	38.0	64	12	54.5	25.8	19	22	24	22	71	33	64	56	.08	.08
Y ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......

FORT STOCKTON, TEX.

[Latitude, 30° 53′ N.; longitude, 102° 53′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 a. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
F ..	27.040	27.33	26.6[illegible]	40.8	63.3	46.9	50.3	86	11	68.3	34.4	27	30	28	28	58	33	51	47	.22	.14
M .	26.932	27.18	26.62	43.8	67.8	53.7	55.1	89	20	72.9	39.0	27	27	29	28	55	27	45	42	.08	.05
A ..	26.895	27.28	26.67	51.0	76.3	63.3	63.5	91	23	80.9	48.3	38	34	38	37	63	26	45	45	.18	.16
M .	26.974	27.22	26.76	62.7	91.1	76.2	76.7	106	44	94.5	60.0	45	42	46	44	54	22	38	38	.25	.25
J ..	26.915	27.17	26.75	66.5	88.9	76.8	77.4	108	55	93.2	64.5	59	54	58	57	78	34	56	56	1.47	.57
J ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
A ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
S ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
O ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
N ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
D ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
Y ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......

Monthly and yearly meteorological summaries—Continued.

FORT SMITH, ARK.

[H=470. T=54. h=48.]

Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.0	6.9	6.6	6.8	5,497	25	NW.	E.	22	4	35	6	0	1	6	16	3	5	10	16	0	9	7	29	0	1	1	J.
4.3	4.8	4.4	4.5	4,140	21	NE.	E.	13	4	25	10	3	7	10	6	6	11	11	6	0	5	3	19	0	0	0	F.
6.3	6.1	4.5	5.6	5,682	24	NW.	E.	10	5	19	18	7	8	7	17	2	7	12	12	0	14	0	5	0	3	0	M.
5.1	5.6	5.1	5.3	4,202	(*)	NW.	SE.	11	6	14	22	15	6	3	10	3	8	14	8	0	12	0	2	0	8	0	A.
3.2	4.7	2.3	3.4	2,671	14	NW.	E.	9	2	23	6	13	18	8	1	13	14	14	3	0	4	0	0	10	2	0	M.
5.8	7.2	4.7	5.9	2,649	49	S.	E.	2	14	30	15	3	1	3	4	18	6	14	10	0	13	0	0	3	11	0	J.
3.2	5.0	3.7	4.0	2,669	18	SE.	E.	2	0	30	19	5	5	3	3	26	14	11	6	0	9	0	0	20	10	0	J.
3.8	4.6	2.1	3.5	2,466	12	E., NW.	E.	3	5	35	15	6	5	4	3	17	16	11	4	0	8	0	0	17	7	0	A.
5.3	6.8	4.2	5.4	3,161	17	SW.	E.	3	6	33	26	3	6	3	2	8	11	9	10	0	7	0	0	8	3	0	S.
3.0	4.8	2.5	3.4	2,895	16	SE.	SE.	6	7	28	32	3	2	2	1	12	17	9	5	0	5	0	2	0	3	0	O.
4.8	5.0	4.2	4.7	3,537	30	NW.	E.	11	4	21	13	6	4	19	8	4	10	12	8	0	9	0	11	0	1	0	N.
4.2	5.1	7.9	4.7	4,505	24	NW., N.	E.	18	6	34	4	3	4	9	9	6	12	10	9	0	5	3	21	0	1	0	D.
4.7	5.6	4.1	4.8	44,073	...	....	E.	110	63	327	186	67	67	77	80	118	131	137	97	0	100	13	89	58	50	1	Y.

FORT SAINT MICHAEL'S, ALASKA.

[H=30. T=13. h=1.]

Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.6	4.2	3.8	3.9	11,755	66	NE.	NE.	21	33	17	10	0	4	1	0	7	17	5	9	0	6	26	30	0	0	6	J.
3.6	3.9	4.3	3.9	10,886	60	S.	N., NE.	21	21	14	1	6	11	2	1	7	12	9	7	0	10	28	28	0	0	8	F.
5.7	5.4	6.0	5.7	11,389	58	E.	SW.	19	18	16	5	7	20	5	0	3	8	13	10	0	9	26	31	0	0	6	M.
5.5	5.0	5.4	5.3	8,950	48	E., SW.	N.	25	13	17	3	11	11	6	0	4	9	9	12	0	4	16	30	0	0	3	A.
8.1	8.4	9.0	8.5	11,298	62	S.	S.	12	12	8	4	24	18	9	3	3	0	6	25	0	17	2	25	0	0	0	M.
7.5	8.1	8.2	7.9	6,860	30	SE.	SW.	11	15	9	4	9	19	11	4	8	2	11	17	0	16	0	5	0	0	0	J.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	J.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	A.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	S.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	O.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	N.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	D.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Y.

FORT STANTON, N. MEX.

[H=6,150. T=21. h=1.]

Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
2.9	3.5	2.8	3.1	7,756	49	NW.	NW.	7	1	1	7	3	6	21	45	2	17	11	3	0	3	3	24	0	0	0	J.
2.6	2.6	1.1	2.1	6,027	40	NW.	NW.	9	1	6	7	3	4	20	34	0	19	9	0	0	3	0	24	0	0	0	F.
1.9	2.9	1.8	2.2	7,795	48	NW.	NW.	2	1	4	10	7	10	22	37	0	20	10	1	0	3	0	26	0	0	0	M.
1.7	2.6	1.8	2.0	7,976	30	NW.	NW.	3	0	4	15	7	5	26	30	0	22	7	1	0	4	0	9	0	0	0	A.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	M.
2.1	3.6	2.5	2.7	4,074	27	SE.	W.	2	3	3	14	16	8	21	20	3	19	9	2	0	11	0	0	1	1	0	J.
2.1	4.8	2.4	3.1	3,713	44	SE.	S.	5	5	10	15	16	15	12	10	5	18	11	2	0	13	0	0	5	1	0	J.
2.4	4.6	3.7	3.6	3,265	22	SE.	NW.	6	1	3	17	15	13	14	23	1	15	14	2	0	12	0	0	0	0	0	A.
3.6	4.3	2.5	3.5	3,045	26	S.	W.	3	6	3	14	10	11	22	20	1	18	4	8	0	9	0	1	0	0	0	S.
1.7	1.8	2.0	1.8	4,209	35	NW.	NW.	2	2	6	19	8	9	21	24	2	23	5	3	0	6	0	5	0	0	0	O.
2.2	2.5	1.9	2.2	6,611	40	W.	NW.	3	1	7	10	3	6	23	37	0	22	7	1	0	3	1	22	0	0	0	N.
2.5	2.6	0.8	2.0	6,648	46	N.	NW.	4	0	0	7	4	4	15	57	2	24	7	0	0	1	0	27	0	0	0	D.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Y.

FORT STOCKTON, TEX.

[H=3,004. T=6.0. h=2.]

Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	J.
3.2	4.1	2.3	3.2	6,183	38	W.	SE.	7	6	5	20	13	12	11	5	5	15	8	5	0	3	0	11	0	0	0	F.
3.4	3.5	2.7	3.2	7,348	47	NW.	S.	6	8	6	20	21	4	12	11	5	14	15	2	0	2	0	7	0	0	0	M.
2.7	3.0	1.1	2.3	9,521	41	SE.	SE.	1	8	4	37	15	11	7	5	2	19	11	0	0	2	0	2	2	0	0	A.
1.2	1.4	1.6	1.4	6,927	36	NW.	SE.	3	7	13	34	22	3	3	2	6	26	5	0	0	1	0	0	23	1	0	M.
3.4	4.1	2.7	3.4	4,125	32	NW.	SE.	4	5	9	19	10	3	1	6	3	10	8	2	0	5	0	0	13	3	0	J.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	J.
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* Gale.

Monthly and yearly meteorological summaries—Continued.

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
FORT SULLY, DAK. [Latitude, 44° 39′ N.; longitude, 100° 39′ W.]																					
J.	28.435	28.87	27.90	—2.4	7.6	0.1	1.8	46	—28	13.4	—8.6	—8	—2	—6	—5	78	66	74	73	.18	.07
F.	28.311	28.77	27.80	17.8	31.8	22.4	24.0	64	—18	36.0	12.0	13	18	16	16	83	59	78	73	.10	.06
M.	28.281	28.73	27.68	23.0	35.3	27.9	28.7	74	—11	39.2	18.5	19	22	22	21	85	63	79	76	.66	.33
A.	28.214	28.71	27.66	37.8	55.9	46.2	46.6	79	12	59.6	34.5	32	37	38	36	81	53	73	69	3.62	2.70
M.	28.242	28.55	27.91	52.9	72.6	59.3	61.6	98	29	75.4	47.8	45	45	47	45	75	38	64	59	.86	.30
J.	28.265	28.62	27.83	59.2	78.4	65.4	67.7	98	43	81.2	54.6	51	50	54	52	76	40	68	62	3.24	2.05
J.	28.219	28.45	27.94	68.4	81.3	78.2	76.0	109	54	94.0	64.0	60	59	59	60	76	37	54	56	2.44	1.10
A.	28.227	28.47	27.95	66.3	87.5	73.3	75.7	106	43	91.0	60.0	56	55	53	55	71	38	55	55	1.41	.92
S.	28.251	28.56	27.76	52.8	70.2	60.3	61.1	100	29	74.7	47.4	42	41	41	41	68	42	51	54	.44	.17
O.	28.309	28.92	27.89	41.9	63.0	51.2	52.0	85	23	66.1	37.7	31	38	34	34	70	46	55	57	.49	.34
N.	28.318	28.78	27.64	24.4	36.6	28.9	30.0	63	zero	40.7	19.2	16	24	23	21	72	64	78	71	1.60	.73
D.	28.422	28.99	27.99	5.0	13.9	9.1	9.3	44	—19	19.2	—1.5	—1	7	4	3	78	74	78	77	.96	.32
Y.	28.291	28.99	27.64	37.3	52.8	43.5	44.5	109	—28	57.5	32.1	30	33	32	32	76	52	67	65	16.00	....
FORT THOMAS, ARIZ. [Latitude, 33° 4′ N.; longitude, 110° 2′ W.]																					
J.	27.289	27.54	26.89	30.4	50.8	42.3	41.2	68	12	54.6	29.0	28	33	37	32	89	55	82	75	2.16	1.01
F.	27.271	27.58	27.00	32.2	62.4	48.5	47.7	74	18	66.0	31.5	29	29	33	30	87	31	58	59	1.40	.91
M.	27.180	27.42	26.94	34.0	63.0	50.7	49.2	83	21	66.6	33.2	30	28	34	31	87	30	55	57	.44	.37
A.	27.129	27.29	26.92	42.0	73.5	61.3	58.9	86	29	77.1	40.5	30	32	36	33	63	24	41	43	.24	.24
M.	27.179	27.33	27.06	53.1	91.5	76.5	73.7	104	43	94.3	51.0	33	35	38	35	48	15	27	30	.00	.00
J.	27.140	27.27	27.00	60.3	96.4	83.5	80.1	105	50	99.0	58.4	42	47	47	46	53	20	29	34	.00	.00
J.	27.141	27.28	27.01	73.1	99.3	88.7	87.0	108	61	102.0	71.7	56	58	58	57	56	26	37	40	.10	.10
A.	27.158	27.33	26.97	72.3	94.1	84.1	83.5	108	62	97.6	70.2	63	57	61	60	74	30	49	51	4.02	1.91
S.	27.179	27.42	27.04	61.2	84.5	72.0	72.6	96	48	87.6	60.2	56	52	55	54	82	36	58	59	1.18	.39
O.	27.250	27.46	27.01	48.9	75.1	60.2	61.4	88	34	78.5	47.3	45	54	51	50	86	48	74	70	1.12	.99
N.	27.312	27.61	26.89	34.7	60.5	44.0	46.4	77	19	64.4	32.5	29	39	36	35	80	46	76	67	.16	.15
D.	27.336	27.59	27.06	28.7	59.6	42.2	43.5	70	19	63.4	27.3	24	38	35	33	86	47	76	69	.04	.04
Y.	27.214	27.61	26.89	47.6	75.9	62.8	62.1	108	12	79.3	46.1	39	42	44	41	74	34	55	54	10.86	....
FORT TOTTEN, DAK. [Latitude, 47° 57′ N.; longitude, 98° 57′ W.]																					
J.	28.521	28.91	27.98	—13.0	—5.8	—12.6	—10.5	32	—43	—1.0	—21.2	—17	—14	—17	—16	76	64	74	71	.91	.30
F.	28.399	28.92	27.86	1.8	11.4	6.7	6.6	45	—38	19.6	5.8	—2	6	3	2	84	78	85	83	.79	.28
M.	28.383	28.90	27.82	11.5	24.9	16.2	17.5	44	—16	29.3	6.5	8	18	12	13	83	75	84	81	.72	.40
A.	28.352	28.82	27.74	33.8	50.5	39.9	41.4	80	—2	53.3	31.6	30	35	35	33	86	58	84	76	.85	.23
M.	28.327	28.63	27.94	45.3	64.7	52.8	54.3	86	25	67.4	42.6	40	41	42	41	81	46	69	65	2.75	1.03
J.	28.373	28.63	28.05	54.3	71.1	59.6	61.7	88	33	73.1	49.7	49	54	53	52	84	56	79	73	2.79	.63
J.	28.350	28.70	27.99	61.9	80.5	68.2	70.2	95	42	82.7	56.8	56	63	60	60	83	56	76	71	1.29	.60
A.	28.336	28.60	28.08	58.0	77.8	64.2	66.7	103	29	80.1	52.8	53	58	55	55	82	53	74	70	1.06	.27
S.	28.301	28.62	27.73	43.0	61.6	48.9	51.2	81	17	64.5	38.8	38	42	41	40	82	51	74	69	.87	.46
O.	28.395	29.03	27.94	37.8	55.7	44.4	46.0	80	20	57.7	35.1	33	36	36	35	82	51	74	70	1.16	.45
N.	28.367	28.83	27.78	13.2	27.6	18.6	19.8	63	—13	31.2	9.8	8	12	13	11	80	56	79	71	.65	.31
D.	28.491	29.12	27.88	—4.5	5.2	—1.2	—0.2	37	—33	8.8	—8.8	—8	zero	—4	—4	85	78	87	83	.38	.11
Y.	28.383	29.12	27.73	28.6	43.8	33.8	35.4	103	—43	47.2	25.0	24	29	27	27	82	60	78	74	14.22	....
FRISCO, UTAH. [Latitude, 38° 25′ N; longitude, 113° 16′ W.]																					
J.	23.642	23.93	23.07	23.6	34.0	28.6	28.7	54	4	37.2	21.6	18	23	21	21	78	64	73	72	.54	.31
F.	23.748	24.03	23.19	33.2	45.3	37.3	38.6	62	11	48.2	31.4	23	23	22	23	66	47	56	56	.19	.15
M.	23.614	23.89	23.13	25.5	37.0	31.1	31.2	58	13	40.5	24.0	19	21	20	20	76	57	68	67	.28	.14
A.	23.570	23.84	23.18	35.1	48.4	41.3	41.6	64	22	51.5	32.9	25	22	23	24	68	40	53	54	.15	.10
M.	23.729	23.97	23.50	52.6	67.6	57.7	59.3	82	29	69.5	49.8	26	22	20	22	37	18	24	27	(*)	(*)
J.	23.712	23.83	23.28	60.1	73.6	67.1	66.9	86	34	77.4	56.4	30	25	25	26	35	18	22	25	(*)	(*)
J.	23.771	23.88	23.61	67.9	81.4	74.2	74.5	92	58	84.7	64.8	41	42	42	42	39	27	33	33	1.35	.66
A.	23.786	23.87	23.64	65.0	76.7	69.2	70.3	88	52	80.6	61.8	47	45	46	46	56	35	49	47	3.52	1.43
S.	23.763	23.93	23.57	57.1	69.3	62.4	62.9	82	39	72.8	54.0	32	33	32	32	40	27	34	34	.11	.11
O.	23.718	24.01	23.41	42.1	52.8	46.5	47.1	67	26	56.2	39.0	28	30	29	29	59	44	53	52	.66	.50
N.	23.762	24.10	22.97	27.7	37.5	31.3	32.2	57	8	40.8	23.2	18	21	19	20	67	54	62	61	1.25	.74
D.	23.785	24.09	23.45	35.5	43.6	37.8	39.0	57	18	46.2	31.1	23	24	23	24	62	48	58	56	.05	.05
Y.	23.717	24.10	22.97	34.8	55.6	48.7	49.4	92	4	58.8	40.8	27	28	27	27	57	40	49	49	8.08	....

* Inappreciable.

Monthly and yearly meteorological summaries—Continued.

FORT SULLY, DAK.

[H=1,600. T=17. h=½.]

Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.3	4.7	4.7	4.9	6,459	44	N.	NW.	16	3	6	15	1	2	1	39	10	8	17	6	0	11	26	31	0	0	3	J.
5.9	5.3	4.4	5.2	7,021	44	NW.	SE.	11	3	2	29	4	1	0	20	14	6	13	9	0	4	10	27	0	0	2	F.
6.2	6.5	5.5	6.1	7,165	44	NW.	SE.	14	7	4	29	6	2	3	23	5	6	14	11	0	7	11	30	0	0	1	M.
4.2	5.8	4.0	4.7	8,063	44	SE.	SE.	3	6	2	35	5	4	4	24	7	8	18	4	0	8	0	10	0	3	4	A.
4.6	5.2	5.3	5.0	5,998	37	SW.	SE.	8	6	7	24	10	4	8	16	10	6	23	2	0	8	0	1	1	7	0	M.
3.3	4.6	2.5	3.5	5,640	39	SE.	SE.	4	8	7	30	3	2	3	16	17	12	18	0	0	9	0	0	4	9	2	J.
4.8	3.5	2.9	3.7	5,835	36	SE.	SE.	7	4	8	24	7	5	9	9	20	14	14	3	0	8	0	0	21	5	1	J.
2.7	2.9	2.3	2.6	5,809	46	SE.	SE.	5	3	14	25	8	3	2	9	24	18	11	2	0	8	0	0	18	1	0	A.
2.7	3.9	3.8	3.5	5,238	42	NW., N.	NW.	6	1	3	13	9	0	9	20	29	16	10	4	0	4	0	1	3	0	0	S.
5.0	4.0	1.3	2.4	7,274	36	SE.	SE.	14	6	3	35	3	2	7	15	8	21	9	1	0	3	0	8	0	0	0	O.
2.3	4.9	3.5	4.2	8,249	48	NW.	NW.	5	2	12	5	5	0	10	44	7	12	13	5	0	8	7	25	0	0	0	N.
4.1	6.5	5.3	5.6	5,744	40	NW.	NW.	4	8	7	5	0	0	5	32	32	7	13	11	0	6	23	31	0	0	0	D.
4.3	4.8	3.8	4.3	78,495	..	....	SE.	97	57	75	269	61	25	61	267	183	134	173	58	0	84	77	164	47	25	13	Y.

FORT THOMAS, ARIZ.

[H=2,710. T=3. h=2.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.3	4.4	3.4	4.0	2,309	18	W.	S.	7	7	14	10	24	3	22	5	1	14	8	9	0	11	0	18	0	0	0	J.
2.2	2.1	1.9	2.1	2,715	25	W.	S.	16	0	22	0	23	1	21	0	1	20	7	1	0	5	0	16	0	0	0	F.
1.1	2.1	1.6	1.6	3,716	26	N.	W.	17	0	15	3	17	3	36	2	0	23	7	1	0	2	0	13	0	0	0	M.
1.9	1.4	1.0	1.4	3,814	29	NW.	W.	10	4	8	5	8	11	30	13	1	24	5	1	0	1	0	3	0	0	0	A.
1.3	3.3	.7	1.8	3,317	24	SW.	W.	8	4	7	5	10	10	38	10	1	24	6	1	0	0	0	0	22	0	0	M.
.8	2.4	.8	1.3	2,497	23	NW.	W.	1	6	15	7	5	3	20	12	6	19	5	0	0	0	0	0	25	0	0	J.
3.1	5.7	3.4	4.1	3,949	33	E.	W.	0	4	16	10	9	6	31	4	13	12	16	3	0	1	0	0	31	1	0	J.
3.0	3.4	3.9	3.4	3,359	32	S.	W.	3	5	7	4	15	12	20	9	16	12	17	1	0	7	0	0	27	2	0	A.
1.7	2.7	1.9	2.1	2,628	19	SW	S., SW.	4	13	8	3	17	17	9	3	16	21	8	1	0	6	0	0	12	4	0	S.
1.3	1.8	1.6	1.6	2,489	21	S., NW.	S.	4	3	10	16	20	13	5	9	13	24	6	1	0	4	0	0	0	2	0	O.
1.7	2.0	1.5	1.7	2,524	24	SW.	S.	3	1	6	7	32	18	7	12	4	23	5	2	0	3	0	15	0	0	0	N.
1.1	1.0	.9	1.0	1,701	20	SE.	SE.	2	1	8	36	15	8	10	8	5	29	2	0	0	1	0	25	0	0	0	D.
2.0	2.7	1.9	2.2	35,018	..	....	W.	75	48	136	106	195	105	249	87	77	245	92	21	0	41	0	90	117	9	0	Y.

FORT TOTTEN, DAK.

[H=1,487. T=15. h=4.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.1	3.0	4.3	4.1	9,281	43	S.	NW.	15	7	1	8	6	11	8	30	7	12	14	5	0	12	30	31	0	0	4	J.
5.8	6.9	4.2	5.6	11,042	56	NW.	NW.	9	5	4	5	14	10	3	28	6	6	14	8	0	11	18	28	0	0	3	F.
5.8	6.7	3.2	5.2	8,050	40	SW., NW.	NW.	8	3	0	22	11	13	5	29	2	10	12	9	0	10	16	31	0	0	4	M.
5.5	5.1	4.6	5.1	10,476	42	SE.	S.	14	12	4	13	15	12	6	13	1	12	6	12	0	8	2	14	0	1	1	A.
4.7	4.0	3.6	4.1	10,235	42	W.	W., NW.	7	13	11	9	7	9	17	17	3	10	18	3	0	11	0	2	0	1	3	M.
4.3	4.7	4.8	4.6	7,461	40	E., W.	N.	16	14	6	15	12	8	9	9	1	10	15	5	0	15	0	0	0	4	2	J.
3.2	2.5	3.2	3.0	7,875	32	NW., SE., S.	SE., NW.	11	13	12	15	14	7	4	15	2	14	16	1	0	8	0	0	4	2	3	J.
3.1	3.5	1.5	2.7	7,973	52	NW.	NE.	18	19	10	5	12	15	1	11	2	15	16	0	0	9	0	1	6	4	4	A.
4.1	5.2	3.0	4.1	10,933	48	NW.	NW.	13	3	6	9	10	6	13	28	2	13	12	5	0	7	0	7	0	2	3	S.
5.5	5.5	4.6	5.2	9,639	45	NW.	S.	12	11	7	7	19	6	14	12	5	9	11	11	0	9	0	9	0	0	6	O.
3.9	5.0	3.4	4.1	9,055	64	NW.	NW.	12	14	1	3	8	12	8	31	1	13	12	5	0	7	15	29	0	0	1	N.
5.3	5.2	3.7	4.7	7,557	50	SW.	NW.	5	11	4	4	4	11	17	26	11	7	20	4	0	8	30	31	0	0	3	D.
4.7	4.8	3.7	4.4	110,477	..	....	NW.	140	125	66	115	132	120	105	249	43	131	166	68	0	115	111	183	10	14	37	Y.

FRISCO, UTAH.

[H=6,406. T=38. h=29.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.7	5.4	3.9	4.7	8,265	60	SW.	SW.	18	3	2	2	2	55	5	4	2	14	7	10	0	4	7	25	0	0	0	J.
3.5	4.4	1.9	3.3	4,944	30	SW.	N.	25	10	3	5	3	18	4	11	5	15	10	3	0	4	1	12	0	0	0	F.
4.6	4.9	3.5	4.3	7,996	38	SW.	SW.	19	8	0	2	2	40	4	16	2	15	6	10	0	7	4	27	0	0	0	M.
4.7	6.3	3.6	4.9	9,111	30	N.	SW.	17	5	2	2	4	39	4	17	0	10	12	8	0	3	0	12	0	0	0	A.
1.2	3.6	1.7	2.2	10,268	37	SW.	SW.	5	6	2	2	2	67	0	9	0	22	8	1	0	0	0	1	0	0	0	M.
.5	2.7	1.7	1.6	8,348	56	SW.	SW.	14	4	2	2	5	53	3	7	0	23	7	0	0	0	0	0	0	1	0	J.
1.0	3.3	3.1	2.5	8,074	48	SW.	SW.	6	3	2	4	7	53	9	8	1	19	11	1	0	8	0	0	7	7	0	J.
3.9	4.0	3.8	3.9	6,234	36	S.	SW.	12	5	3	2	10	36	14	10	1	14	10	7	0	15	0	0	0	14	0	A.
.9	1.1	.5	.8	6,783	32	S.	N.	29	7	1	0	8	26	12	7	0	28	2	0	0	1	0	0	0	1	0	S.
1.9	2.6	2.3	2.3	9,433	50	SW.	SW.	21	3	0	4	10	42	5	8	0	23	6	2	0	3	0	9	0	0	0	O.
3.2	2.3	2.3	2.6	5,719	43	SW.	N.	31	5	4	6	5	17	8	11	3	20	7	3	0	6	3	25	0	0	0	N.
3.5	3.4	2.5	3.1	6,058	43	SW.	SW.	16	8	1	5	8	31	14	7	3	17	12	2	0	1	0	14	0	0	0	D.
2.8	3.7	2.6	3.0	91,233	..	....	SW.	213	67	22	36	66	477	82	115	17	220	98	47	0	52	15	125	7	23	0	Y.

Monthly and yearly meteorological summaries—Continued.

GALVESTON, TEX.

[Latitude, 29° 18′ N.; longitude, 94° 47′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	30.087	30.64	29.64	43.6	50.5	47.8	47.3	69	11	54.9	39.8	41	45	44	43	90	82	85	86	3.45	1.44
F ..	30.107	30.64	29.69	50.5	56.5	53.4	53.5	71	32	59.4	47.1	45	46	47	46	82	71	81	78	2.31	1.03
M .	30.001	30.32	29.59	57.1	61.6	58.4	59.0	71	38	63.6	53.6	52	51	53	52	85	72	84	80	3.19	1.65
A ..	29.980	30.35	29.62	64.4	69.4	65.6	66.5	80	43	72.1	61.5	60	60	60	60	86	74	85	81	2.15	1.10
M .	29.987	30.16	29.86	72.2	78.3	73.4	74.6	87	60	80.6	69.9	67	66	68	67	84	67	83	78	.03	.02
J ..	29.885	30.05	29.47	78.1	83.5	79.4	80.3	90	67	85.8	75.2	73	73	74	73	85	72	83	80	6.19	3.52
J ..	29.934	30.13	29.70	80.7	85.9	81.7	82.8	92	68	88.5	78.0	74	73	74	74	82	67	78	75	1.20	.28
A ..	29.945	30.09	29.67	80.8	86.4	82.3	83.2	94	71	88.9	78.6	75	74	75	75	82	68	78	76	.....	....
S ..	29.974	30.11	29.77	78.3	82.2	79.8	80.1	89	61	85.2	73.9	73	73	73	73	84	74	80	79	13.31	2.83
O ..	30.105	30.33	29.35	68.7	74.7	71.4	71.6	83	50	77.2	66.4	62	62	62	62	79	66	74	73	1.93	1.49
N ..	30.129	30.55	29.73	59.2	65.0	61.8	62.0	85	34	69.6	55.1	53	53	54	54	81	67	77	75	2.65	1.43
D ..	30.134	30.50	29.78	54.3	58.5	55.8	56.2	72	25	62.3	50.6	49	50	51	50	83	76	84	81	2.10	1.42
Y ..	30.022	30.64	29.35	65.7	71.0	67.6	68.1	94	11	74.0	62.5	60	61	61	61	84	71	81	79	.....	....

GRAND HAVEN, MICH.

[Latitude, 43° 5′ N.; longitude, 86° 18′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	29.315	29.77	28.76	19.4	21.9	19.2	20.2	50	—1	25.4	14.9	16	16	14	16	86	78	81	81	2.62	.52
F ..	29.325	29.90	28.60	21.6	25.2	22.4	23.1	49	—15	30.4	15.8	18	19	17	18	86	77	78	80	3.50	1.33
M .	29.243	29.81	28.38	26.8	34.4	30.0	30.4	62	5	37.0	24.7	23	26	25	25	85	73	82	80	3.04	1.31
A ..	29.355	29.73	28.67	43.2	52.2	46.6	47.3	77	19	57.8	39.3	37	40	39	39	80	65	76	74	2.84	1.08
M .	29.273	29.63	28.94	49.8	54.8	52.4	52.3	78	34	61.7	45.2	43	44	44	44	80	70	75	75	1.99	.74
J ..	29.295	29.57	28.99	58.0	64.2	60.8	61.0	80	44	69.8	53.6	52	52	51	52	80	67	77	75	2.31	1.69
J ..	29.298	29.53	29.04	62.3	70.2	65.2	65.9	87	46	75.4	58.4	58	62	60	60	87	78	83	82	.90	.42
A ..	29.297	29.58	28.99	63.2	71.2	66.8	67.1	86	46	76.2	59.8	58	59	59	59	85	67	77	76	6.57	3.05
S ..	29.360	29.68	28.98	58.3	65.4	61.0	61.6	82	40	68.8	54.9	52	53	53	53	80	60	76	74	4.81	2.20
O ..	29.474	29.90	28.48	48.5	56.6	51.7	52.3	73	28	60.2	44.0	43	47	44	45	82	70	78	77	2.50	1.54
N ..	29.280	29.68	28.59	33.3	37.5	35.3	35.4	69	6	42.9	28.8	27	27	28	27	79	67	75	74	2.56	1.16
D ..	29.415	29.91	28.84	21.1	24.5	21.9	22.5	49	—3	28.0	15.6	16	18	17	17	80	78	82	80	1.67	.41
Y ..	29.327	29.91	28.38	42.1	48.2	44.4	44.9	87	—15	52.8	37.9	37	39	38	38	82	71	78	77	35.31	....

GREEN BAY, WIS.

[Latitude, 44° 31′ N.; longitude, 88° W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	....
F ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	....
M .	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	....
A ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	....
M .	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	....
J ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	....
J ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	....
A ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	....
S ..	29.334	29.65	29.00	54.6	65.1	56.9	58.9	90	35	67.9	50.5	51	52	53	52	88	66	86	80	3.58	.90
O ..	29.457	29.96	28.54	45.9	59.4	49.6	51.6	78	27	61.3	42.1	43	49	46	46	91	69	86	82	5.40	2.72
N ..	29.284	29.73	28.47	26.5	35.1	29.9	30.5	67	1	37.6	23.5	22	24	24	24	84	66	81	77	2.88	.95
D ..	29.442	30.03	28.94	9.6	18.7	13.2	13.8	44	—21	21.1	5.8	7	12	10	10	88	77	85	83	1.36	.54
Y ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	....

GREENCASTLE, IND.

[Latitude, 39° 39′ N.; longitude, 86° 51′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	29.071	29.56	28.52	19.3	25.3	21.2	21.9	54	—15	30.3	14.0	16	20	18	18	85	80	86	84	4.65	1.38
F ..	29.128	29.64	28.52	25.8	33.4	28.9	29.4	60	— 2	38.2	21.3	21	21	23	22	82	68	78	76	2.33	1.28
M .	29.008	29.49	28.27	31.4	45.9	39.4	39.9	75	16	48.5	32.1	29	32	32	31	81	60	77	72	3.40	.85
A ..	29.081	29.41	28.69	49.4	60.6	53.6	54.5	81	26	63.3	47.5	43	45	44	44	79	60	70	70	3.27	.62
M .	29.012	29.38	28.60	56.7	70.9	62.7	63.4	84	41	73.4	54.9	51	55	54	53	82	58	73	71	2.37	.56
J ..	29.035	29.28	28.78	63.2	75.3	66.9	68.5	84	48	76.9	61.1	58	60	59	59	82	61	77	74	3.59	1.12
J ..	29.032	29.22	28.82	66.6	81.6	72.7	73.6	92	53	83.4	64.8	61	63	63	62	82	55	73	70	1.53	1.22
A ..	29.052	29.29	28.77	67.4	80.0	71.1	72.8	92	54	82.5	66.0	64	65	65	64	88	62	80	77	4.53	1.14
S ..	29.146	29.38	28.85	60.5	73.1	64.9	66.2	86	44	75.3	58.9	56	59	58	58	86	63	79	76	5.36	2.75
O ..	29.244	29.53	28.48	49.4	64.1	55.8	56.4	79	35	65.9	48.3	44	48	47	46	82	57	73	70	.62	.37
N ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	....
D ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	....
Y ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	....

Monthly and yearly meteorological summaries—Continued

GALVESTON, TEX.

[H=40. T=59. h=51.]

Cloudiness (in tenths): 7 a.m.	3 p.m.	11 p.m.	Mean.	Wind: Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days—: Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
4.8	5.8	4.3	5.0	9,052	42	N.	E.	14	10	17	11	12	4	9	15	1	9	14	8	2	10	1	7	0	3	0	J.
3.3	5.1	3.5	4.0	7,981	37	NW.	E.	10	7	18	14	16	8	2	8	1	13	11	4	0	8	0	1	0	1	0	F.
5.4	5.8	4.6	5.3	8,956	36	NW., SE.	E.	17	4	21	19	18	3	2	8	1	7	15	9	2	9	0	0	0	1	0	M.
5.6	4.8	3.1	4.5	8,096	32	N.	SE.	9	5	10	38	21	1	2	4	0	9	16	5	1	8	0	0	0	3	0	A.
4.4	3.0	3.5	3.6	8,414	30	NW.	S.	4	5	9	16	39	12	2	3	3	14	12	5	0	2	0	0	0	0	0	M.
5.2	4.6	4.3	4.7	6,822	50	N., NE.	S.	9	7	13	17	30	7	3	2	2	9	17	4	0	10	0	0	0	7	0	J.
4.9	5.0	1.9	3.9	5,954	32	NE.	S.	4	4	2	19	42	11	7	2	2	11	19	1	0	7	0	0	5	3	0	J.
4.6	3.9	2.1	3.5	6,945	53	NE.	SE.	4	8	11	28	26	10	0	4	2	16	13	2	0	7	0	0	6	2	0	A.
5.6	5.7	4.2	5.2	8,947	34	SE	E.	4	11	27	22	24	2	0	0	0	9	13	8	0	17	0	0	0	4	0	S.
2.8	1.7	1.2	1.9	7,144	55	NW.	E.	21	17	24	23	3	2	1	1	1	23	6	2	0	5	0	0	0	0	0	O.
5.3	3.7	4.2	4.4	6,456	28	N.	S.	8	17	7	15	26	11	1	5	0	10	12	8	0	12	0	0	0	0	0	N.
4.6	3.9	3.0	3.8	6,170	32	N., NW., NE.	N., SE.	22	9	12	22	15	6	1	6	0	16	9	6	0	7	0	2	0	2	0	D.
4.7	4.4	3.3	4.1	90,937	...	....	S.	126	104	171	244	272	77	30	58	13	146	157	62	5	102	1	10	11	26	0	Y.

GRAND HAVEN, MICH.

[H=620. T=86. h=75.]

7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
8.1	9.1	8.3	8.5	8,341	40	NW.	E.	9	10	21	17	5	4	9	18	0	1	8	22	0	23	24	29	0	0	0	J.
8.0	8.0	6.2	7.4	8,076	36	W., SW.	W.	5	8	15	10	14	8	17	6	1	3	8	17	0	18	12	23	0	0	0	F.
5.6	6.0	5.7	5.8	7,316	36	NW.	NE.	13	18	12	3	13	8	8	16	2	9	8	14	0	16	8	26	0	4	0	M.
7.0	5.0	5.8	5.9	7,810	31	N.	E.	6	12	24	7	13	6	8	12	2	8	10	12	1	12	0	7	0	4	0	A.
5.2	5.1	4.4	4.9	7,572	34	S.	S.	8	8	11	2	22	11	16	14	1	9	14	8	0	10	0	0	0	5	0	M.
2.5	3.2	3.4	3.0	5,859	25	S., NW.	NW.	4	6	9	11	10	9	14	24	3	16	13	1	0	5	0	0	0	4	2	J.
2.0	3.9	2.3	2.7	5,782	28	NE.	NW.	7	11	7	6	16	9	15	19	3	16	15	0	0	5	0	0	0	2	1	J.
5.5	4.0	3.5	4.3	6,165	28	E.	S.	7	8	9	12	20	6	13	13	5	12	14	5	0	6	0	0	0	5	1	A.
6.7	6.0	5.4	6.0	8,265	41	W.	S.	3	5	12	15	22	6	12	14	1	4	15	11	0	14	0	0	0	4	0	S.
6.3	5.8	4.5	5.5	8,412	52	NW.	S.	6	12	8	10	30	12	7	8	0	7	14	10	0	8	0	3	0	0	0	O.
7.4	7.9	6.8	7.4	10,612	52	SW.	W., NW	6	9	9	10	10	14	16	16	0	3	9	18	0	12	5	20	0	0	0	N.
8.0	8.0	7.2	7.7	8,653	39	SW.	NW.	12	11	8	10	16	6	9	18	3	4	6	21	0	19	20	28	0	0	0	D.
6.0	6.0	5.3	5.8	92,863	...	....	S.	86	118	145	113	191	99	144	178	21	92	134	139	1	148	69	136	0	28	4	Y.

GREEN BAY, WIS.

[H=616. T=50. h=41.]

7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	J.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	F.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	M.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	A.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	M.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	J.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	J.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	A.
6.4	7.3	4.5	6.1	4,577	...		S.	8	2	4	14	31	10	15	2	4	3	18	9	0	16	0	0	0	3	0	S.
5.4	5.5	4.9	5.3	6,457	36	NW.	S.	10	7	4	7	38	15	5	7	0	10	9	12	0	8	0	6	0	1	0	O.
6.3	6.9	4.8	6.0	6,592	31	W.	W.	8	5	4	0	19	19	23	12	0	6	13	11	0	14	9	26	0	2	1	N.
5.8	6.7	4.0	5.5	5,605	29	W.	SW.	12	8	1	0	11	24	18	14	5	8	11	12	1	12	26	28	0	0	1	D.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	Y.

GREENCASTLE, IND.

[H=897. T=38. h=69.]

7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
7.7	7.8	6.9	7.5	5,682	24	W.	SE.	5	10	5	21	7	14	17	12	2	3	12	16	0	18	16	28	0	0	0	J.
5.5	6.4	5.2	5.7	6,461	28	NW.	S.	8	6	5	14	17	13	8	12	1	6	10	12	0	10	8	23	0	0	0	F.
5.9	5.8	6.1	5.9	6,429	32	S.	NE., SW.	9	17	4	11	10	17	6	16	3	7	13	11	0	16	0	16	0	1	0	M.
5.7	6.6	3.9	5.4	5,993	24	SW., NW., S.	SE.	9	15	8	23	14	9	3	9	0	9	12	9	0	12	0	8	0	4	0	A.
3.9	4.8	4.4	4.4	4,261	30	W.	SW.	15	13	6	8	16	18	3	14	0	8	18	5	0	12	0	0	0	11	0	M.
4.8	4.8	3.0	4.2	3,227	15	N.	SE.	12	13	7	21	12	8	8	9	0	12	16	2	0	11	0	0	0	8	0	J.
2.9	3.7	1.6	2.7	2,807	16	S.	N.	22	13	16	9	11	10	4	5	3	19	11	1	0	6	0	0	3	7	0	J.
5.1	5.1	2.6	4.3	3,227	31	W.	S.	12	14	12	14	17	12	4	4	4	11	15	5	0	13	0	0	3	10	0	A.
4.7	4.8	2.9	4.1	3,224	28	W.	SE.	8	1	4	24	20	12	7	8	6	12	13	5	0	11	0	0	0	5	0	S.
2.7	2.9	2.9	2.8	3,527	30	W.	SE.	13	4	4	20	17	12	7	12	4	20	7	4	0	5	0	0	0	0	0	O.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	N.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	D.
...	...	...	...	......	...	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	Y.

***Monthly and yearly meteorological summaries*—Continued.**

HATTERAS, N. C.

[Latitude, 35° 15′ N.; longitude, 75° 40′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	30.031	30.69	29.17	37.9	41.7	39.9	39.8	63	14	46.3	34.7	34	36	36	35	86	81	88	84	7.17	1.52
F ..	30.105	30.56	29.55	39.7	45.3	40.6	41.9	67	13	50.5	34.5	33	35	33	34	78	66	77	74	2.29	.95
M .	29.996	30.30	29.40	46.2	51.5	48.1	48.6	68	29	55.3	43.0	40	43	41	41	81	73	77	77	4.15	1.19
A ..	30.074	30.42	29.52	57.2	62.3	57.2	58.9	76	39	65.9	53.1	53	53	51	52	87	73	81	80	2.97	1.26
M .	29.965	30.34	29.43	65.7	68.7	64.2	66.2	80	49	72.1	60.3	59	59	59	59	81	74	85	80	2.71	.89
J ..	29.985	30.24	29.74	73.2	75.9	71.5	73.5	84	60	78.8	68.0	67	67	68	68	82	76	89	82	5.51	1.26
J ..	29.971	30.18	29.77	77.0	79.8	76.3	77.7	86	68	82.1	73.5	73	73	73	73	89	80	90	86	7.57	4.04
A ..	29.991	30.32	29.62	74.9	77.7	74.0	75.5	84	65	80.1	71.5	71	72	71	71	89	82	90	87	9.74	2.24
S ..	30.121	30.32	29.84	73.9	76.8	72.8	74.5	83	64	79.4	69.6	68	68	67	68	84	76	82	81	4.11	2.59
O ..	30.160	30.45	29.87	64.0	68.3	63.7	65.3	79	48	70.7	59.5	60	60	59	60	86	74	86	82	.98	.68
N ..	30.105	30.39	29.71	53.9	58.7	55.1	55.9	75	35	62.8	48.6	46	48	47	47	78	69	76	74	1.56	.74
D ..	30.126	30.51	29.53	43.4	47.2	44.7	45.1	68	27	54.1	38.5	39	41	40	40	85	81	86	84	5.96	2.65
Y ..	30.052	30.69	29.17	58.9	62.8	59.0	60.2	86	13	66.5	54.6	54	54	54	54	84	76	84	81	54.72	.....

HELENA, MONT.

[Latitude, 46° 34′ N.; longitude, 112° 4′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	25.802	26.33	25.32	6.4	12.3	11.6	10.1	49	-30	21.2	1.4	-1	4	4	2	73	70	71	71	.82	.32
F ..	25.811	26.08	25.36	31.3	38.2	34.0	34.5	62	-13	44.4	27.4	21	21	22	21	66	53	62	60	.56	.28
M .	25.759	26.11	25.27	24.4	32.5	30.3	29.1	62	-10	38.6	20.6	16	20	20	19	70	61	67	66	1.00	.41
A ..	25.718	26.19	25.30	35.5	48.8	44.4	42.9	71	27	55.4	33.2	28	28	28	28	73	46	55	58	2.69	1.60
M .	25.832	26.10	25.49	45.5	61.5	57.6	54.9	89	26	67.5	44.0	34	34	34	34	66	38	43	49	.40	.33
J ..	25.849	26.14	25.68	51.3	68.7	63.3	61.1	88	40	74.4	49.2	41	43	41	42	68	42	47	52	1.14	.58
J ..	25.868	26.03	25.61	58.5	78.7	72.4	69.9	103	43	85.2	56.3	45	48	44	46	62	37	40	46	.55	.19
A ..	25.839	26.12	25.62	56.8	76.9	70.6	68.1	95	48	83.9	55.2	41	48	46	45	57	38	43	46	.03	.03
S ..	25.855	26.13	25.51	45.5	59.4	53.7	52.9	82	31	65.7	42.0	35	37	36	36	68	45	55	56	2.40	1.62
O ..	25.853	26.22	25.59	38.4	47.9	43.6	43.3	73	23	53.0	34.6	31	33	32	32	75	59	67	67	1.57	.52
N ..	25.889	26.31	25.41	26.6	32.1	29.6	29.4	59	-9	38.5	20.2	19	21	20	20	72	65	69	69	.49	.32
D ..	25.804	26.22	25.45	24.4	30.4	26.5	27.1	56	-15	36.1	18.7	18	21	19	19	76	69	74	73	.98	.44
Y ..	25.823	26.33	25.27	37.0	49.0	44.8	43.6	103	-30	55.3	33.6	27	30	29	29	69	52	58	60	12.63	.....

HURON, DAK.

[Latitude, 44° 21′ N.; longitude, 98° 9′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	28.747	29.18	28.22	-4.3	6.8	-1.6	0.3	42	-32	11.4	-11.1	-11	-2	-9	-7	74	69	71	72	.48	.16
F ..	28.634	29.13	28.04	12.8	25.6	17.6	18.7	59	-27	31.4	7.3	9	18	14	14	85	75	84	82	.16	.11
M .	28.602	29.02	28.03	20.4	33.4	26.9	26.6	65	-6	36.5	18.4	17	27	22	22	84	78	84	82	.62	.18
A ..	28.540	29.02	27.93	36.7	55.9	45.8	46.1	83	9	59.3	35.0	32	45	40	39	83	68	80	77	3.52	2.35
M .	28.561	28.85	28.21	49.6	70.7	58.4	59.6	96	32	74.2	46.4	45	56	52	51	84	61	79	75	1.58	.45
J ..	28.582	28.92	28.15	56.2	76.0	63.6	65.3	90	39	78.9	52.1	53	60	59	57	88	60	85	78	1.90	.86
J ..	28.545	28.85	28.28	64.5	86.3	72.4	74.4	104	55	89.7	62.5	60	63	64	62	86	48	77	70	1.60	.71
A ..	28.550	28.80	28.30	60.2	81.9	67.8	70.0	100	33	84.4	57.9	57	59	61	59	88	49	80	72	5.62	2.49
S ..	28.553	28.90	28.04	49.3	70.3	56.5	58.7	95	28	73.8	46.2	44	42	46	44	83	39	69	64	1.59	.95
O ..	28.635	29.21	28.16	40.2	62.8	49.0	50.7	85	19	66.2	37.9	35	38	40	38	83	45	74	67	1.26	.60
N ..	28.612	29.08	27.67	22.0	35.4	23.5	27.0	60	-5	38.9	16.3	14	16	16	15	72	48	72	64	1.18	.06
D ..	28.747	29.38	28.26	3.2	14.4	7.6	8.4	48	-32	19.8	-1.9	-3	6	2	2	76	71	77	75	.74	.27
Y ..	28.609	29.38	27.67	34.2	51.6	40.6	42.1	104	-32	55.4	30.6	29	36	34	33	82	59	78	73	20.25	....

INDIANAPOLIS, IND.

[Latitude, 39° 46′ N.; longitude, 86° 10′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	29.213	29.74	28.65	19.6	25.2	21.8	22.2	55	-15	30.0	14.6	17	20	19	18	90	79	88	86	4.02	1.38
F ..	29.274	29.81	28.64	24.5	32.5	27.6	28.2	54	-4	36.5	19.9	21	22	21	21	86	66	77	76	1.51	.61
M .	29.145	29.64	28.39	33.7	46.0	38.6	39.4	76	16	47.9	31.0	28	29	31	29	81	54	76	70	2.85	1.23
A ..	29.219	29.55	28.83	48.6	61.7	53.4	54.6	84	24	63.6	46.1	41	42	43	42	75	53	70	66	3.09	.89
M .	29.145	29.52	28.72	57.3	73.0	62.6	64.3	87	39	75.3	53.5	52	54	53	53	82	53	73	70	3.82	1.33
J ..	29.171	29.42	28.90	63.9	76.9	66.9	69.2	89	47	78.8	59.6	57	56	59	58	80	52	76	69	4.92	1.58
J ..	29.166	29.35	28.95	66.5	84.5	71.9	74.3	95	51	86.1	62.9	60	59	62	60	80	44	71	65	2.27	1.86
A ..	29.191	29.41	28.90	67.0	80.8	70.8	72.9	92	53	84.1	64.0	62	61	63	62	85	54	78	72	6.70	2.11
S ..	29.284	29.53	28.97	60.1	75.4	64.4	66.6	90	43	77.9	56.9	55	56	56	56	84	53	75	70	3.43	1.31
O ..	29.386	29.67	28.61	46.6	65.7	53.6	55.3	82	32	67.4	44.7	42	42	44	42	83	45	71	66	1.20	.61
N ..	29.227	29.59	28.64	34.7	44.9	38.4	39.3	72	16	48.1	31.1	28	28	27	28	78	56	66	67	3.87	2.00
D ..	29.328	29.69	28.76	20.9	30.1	24.5	25.2	58	-3	33.0	17.0	17	20	18	18	85	67	79	77	2.20	1.03
Y ..	29.229	29.81	28.39	45.3	58.1	49.5	51.0	95	-15	60.7	41.8	40	41	41	41	82	56	75	71	39.88	....

Monthly and yearly meteorological summaries—Continued.

HATTERAS, N. C.

[$H = 12.$ $T = 7.$ $h = 1.$]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.4	4.8	4.4	4.9	10,913	46	W.	N.	40	10	4	4	3	3	20	8	1	10	13	8	1	14	3	9	0	2	0	J.
4.0	3.8	2.7	3.5	8,651	40	NW.	N.	19	18	0	5	10	12	5	14	1	15	8	5	0	9	1	11	0	1	0	F.
4.1	4.8	3.2	4.0	10,201	39	N.	W.	14	14	3	2	12	17	19	12	0	14	10	7	0	9	0	4	0	0	0	M.
5.2	4.0	3.2	4.1	7,796	30	W.	NE.	21	22	8	7	5	16	7	2	2	13	9	8	0	7	0	0	0	0	0	A.
4.3	3.6	2.6	3.5	8,166	48	NW.	SW.	9	13	3	2	13	36	10	6	2	16	10	5	0	9	0	0	0	1	0	M.
5.9	5.0	4.2	5.0	7,124	26	SE.	NE.	7	27	6	7	9	24	9	1	0	9	11	10	0	16	0	0	0	2	0	J.
5.0	4.3	3.8	4.4	6,218	37	S.	SW.	1	16	6	3	19	26	14	4	4	13	12	6	0	10	0	0	0	2	0	J.
5.9	5.8	4.5	5.4	7,140	36	NE.	SW.	11	13	9	8	5	29	8	4	6	6	17	8	0	18	0	0	0	4	0	A.
3.9	3.2	3.3	3.5	5,181	23	N., NE.	NE.	5	43	2	1	7	11	11	1	9	15	10	5	0	4	0	0	0	0	0	S.
3.7	3.7	2.1	3.2	6,054	23	N.	N.	36	23	4	1	3	5	7	11	3	15	12	4	0	4	0	0	0	0	0	O.
3.3	3.8	2.6	3.2	7,611	40	NW.	NW.	19	7	2	0	4	17	12	21	8	17	10	3	0	8	0	0	0	0	0	N.
4.7	5.5	3.9	4.7	9,219	37	NW.	N.	34	1	1	2	6	6	18	24	1	9	15	7	0	11	0	5	0	1	0	D.
4.6	4.3	3.4	4.1	94,274	...	....	N.	216	207	48	42	95	202	140	108	37	152	137	76	1	119	4	29	0	13	0	Y.

HELENA, MONT.

[$H = 4,069.$ $T = 66.$ $h = 53.$]

4.8	6.2	5.9	5.6	4,547	42	SW.	N.	26	7	2	1	2	23	13	14	5	4	18	9	0	11	16	29	0	1	0	J.
4.6	5.4	5.0	5.0	6,980	44	NW.	SW.	12	4	4	0	3	33	25	3	0	6	16	6	0	7	4	16	0	0	0	F.
4.8	6.1	4.7	5.2	5,767	36	W.	SW.	8	7	3	1	3	45	19	7	0	10	15	6	0	14	7	27	0	0	0	M.
5.5	5.6	5.9	5.7	6,023	40	SW., W.	SW.	3	7	6	2	10	37	15	10	0	6	15	9	0	8	0	12	0	0	0	A.
4.1	6.0	4.3	4.8	6,219	32	N.	SW.	5	9	3	2	4	38	16	16	0	7	21	3	0	2	0	5	0	4	0	M.
3.8	5.5	4.8	4.7	5,825	40	SW.	SW.	3	16	3	6	2	47	5	8	0	9	16	5	0	12	0	0	0	4	0	J.
2.3	4.8	3.7	3.6	5,245	44	SW.	SW.	6	11	3	5	2	48	11	7	0	12	18	1	0	8	0	0	10	6	0	J.
0.7	1.3	2.1	1.4	5,388	36	SW.	SW.	5	14	1	0	1	56	5	11	0	23	8	0	0	1	0	0	8	0	0	A.
3.6	3.7	3.0	3.4	5,342	30	SW.	SW.	4	13	0	0	0	54	9	9	1	15	9	6	0	7	0	2	0	0	0	S.
5.1	5.1	5.3	5.2	4,984	28	SW.	SW.	10	9	2	0	0	36	16	19	1	8	14	9	0	10	0	15	0	0	0	O.
5.1	5.4	5.9	5.5	5,273	44	SW.	SW.	14	5	5	0	5	35	15	11	0	8	13	9	0	8	6	25	0	0	0	N.
5.9	6.8	6.5	6.4	4,724	44	SW.	SW.	14	11	0	1	0	29	20	15	3	4	14	13	0	10	7	28	0	0	1	D.
4.2	5.2	4.8	4.7	66,317	...	....	SW.	110	113	32	18	32	481	169	130	10	112	177	76	0	98	40	159	18	15	1	Y.

HURON, DAK.

[$H = 1,307.$ $T = 48.$ $h = 37.$]

4.6	5.7	4.3	4.9	6,668	34	NW.	NW.	21	2	0	19	4	0	2	34	11	8	18	5	0	13	28	31	0	0	0	J.
5.0	5.1	3.6	4.6	6,767	38	NW.	NW.	14	3	7	18	9	2	3	22	6	6	17	5	0	4	11	28	0	0	0	F.
6.2	6.7	5.3	6.1	7,706	44	NW.	NW.	11	13	6	22	5	3	4	24	5	4	16	11	0	9	12	30	0	0	0	M.
5.1	5.4	3.9	4.8	7,792	38	NW.	SE.	18	5	6	31	7	4	3	11	5	9	12	9	0	11	0	9	0	0	0	A.
5.0	4.4	3.9	4.4	5,548	27	SW.	SE.	13	8	9	18	15	6	2	17	5	8	20	3	0	12	0	0	1	7	1	M.
3.2	4.6	2.8	3.5	5,074	30	SW.	NW.	5	18	6	18	9	4	5	23	2	15	10	5	0	11	0	0	1	7	2	J.
4.5	3.8	2.9	3.7	6,094	32	S.	SE.	1	13	9	31	22	3	3	8	3	13	15	3	0	11	0	0	14	10	1	J.
3.2	3.9	3.6	3.6	5,749	40	NE.	SE.	13	14	5	26	14	5	0	14	2	10	18	3	0	12	0	0	9	8	0	A.
4.4	3.2	4.4	4.0	5,955	34	SE.	NW.	11	3	3	19	10	10	3	25	6	10	15	5	0	10	0	1	2	3	0	S.
2.9	4.2	2.3	3.1	6,880	34	SW.	SE.	7	3	0	41	8	8	4	17	5	18	9	4	0	6	0	9	0	2	0	O.
5.5	5.0	4.0	4.8	7,025	42	NW.	NW.	5	7	2	23	4	6	6	35	2	10	12	8	0	9	7	27	0	1	0	N.
3.2	5.0	4.0	4.1	5,650	31	NW.	NW.	6	5	5	26	4	4	4	37	2	10	18	3	0	10	21	31	0	0	0	D.
4.4	4.8	3.8	4.3	76,908	...	....	SE.	125	94	58	292	111	55	39	267	54	121	180	64	0	118	79	166	27	38	4	Y.

INDIANAPOLIS, IND.

[$H = 766.$ $T = 76.$ $h = 74.$]

7.7	7.4	7.1	7.4	5,296	24	W.	W.	5	7	7	16	16	11	17	14	0	2	11	18	0	17	17	28	0	0	0	J.
5.8	6.5	5.4	5.9	5,163	28	W.	S.	8	1	6	6	20	17	9	17	0	6	11	11	0	9	10	24	0	1	0	F.
6.2	5.8	6.0	6.0	5,177	22	NW.	NW.	7	11	5	10	12	15	11	21	1	7	12	12	0	16	2	20	0	2	0	M.
6.2	7.2	4.2	5.9	4,164	20	W., NW.	SE.	5	12	10	22	9	12	5	12	3	8	13	9	0	11	1	8	0	2	0	A.
4.7	5.8	4.7	5.1	3,477	20	NW.	SW.	13	8	3	6	17	20	4	16	6	7	17	7	0	12	0	0	0	5	0	M.
5.7	5.7	3.9	5.1	3,151	18	NW.	S.	12	12	9	6	15	12	11	11	2	9	13	8	0	13	0	0	0	5	0	J.
3.8	4.3	2.4	3.5	2,921	24	NW.	SW.	13	12	12	6	8	15	7	13	7	14	12	5	0	7	0	0	7	5	1	J.
5.4	5.8	3.4	4.9	3,028	32	NW.	S.	14	12	13	6	18	10	7	9	4	11	12	8	0	13	0	0	5	10	0	A.
5.1	5.7	2.8	4.5	3,320	22	S., NW.	S.	6	0	5	14	24	18	9	9	5	7	18	5	0	10	0	0	1	4	0	S.
3.1	3.3	2.8	3.1	3,161	26	W.	S.	7	4	4	6	20	17	8	14	13	20	7	4	0	4	0	1	0	0	0	O.
5.9	5.9	5.2	5.7	4,730	29	W.	SW.	5	5	3	8	19	24	16	10	0	7	14	9	0	12	2	18	0	0	0	N.
6.2	5.6	5.0	5.3	4,655	28	NW.	NW.	13	8	10	10	16	9	10	17	0	10	10	11	0	14	15	28	0	0	0	D.
5.4	5.8	4.4	5.2	48,243	...	....	S.	108	92	87	116	194	180	114	163	41	108	150	107	0	138	47	127	13	34	1	Y.

Monthly and yearly meteorological summaries—Continued.

INDIANOLA, TEX.

[Latitude, 28° 32′ N.; longitude, 96° 31′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	30.088	30.68	29.64	42.4	50.7	45.8	46.3	73	12	54.4	38.3	39	43	41	41	87	77	86	83	2.51	1.10
F ..	30.096	30.61	29.65	51.9	60.7	55.1	55.9	73	28	63.2	48.4	49	50	50	50	90	70	85	82	3.29	1.91
M .	29.983	30.33	29.57	58.3	64.3	60.2	60.9	79	40	67.3	55.2	54	54	56	55	88	74	86	82	3.16	2.12
A ..	29.952	30.38	29.61	64.7	72.0	66.4	67.7	86	40	74.2	62.8	62	62	63	62	91	73	88	84	.80	.53
M .	29.963	30.14	29.80	71.4	82.1	74.1	75.9	91	59	84.2	70.0	68	67	68	68	88	62	83	78	.20	.19
J ..	29.868	30.04	29.64	77.2	85.8	79.5	80.8	94	67	89.0	75.7	74	73	74	73	89	67	83	80	2.97	1.38
J ..	29.913	30.10	29.68	79.1	88.0	81.4	82.8	96	73	90.3	77.7	75	74	75	75	88	64	82	78	1.39	.72
A ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
S ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
O ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
N ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
D ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
Y ..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......

JACKSONVILLE, FLA.

[Latitude, 30° 20′ N.; longitude, 81° 39′ W.]

J ..	30.033	30.52	29.48	45.7	57.3	49.1	50.7	73	15	59.4	43.2	42	44	44	44	88	64	84	79	2.81	1.54
F ..	30.108	30.58	29.82	48.0	60.4	52.0	53.5	73	24	62.5	45.8	44	47	48	46	85	63	85	78	1.87	1.30
M .	30.017	30.36	29.64	55.5	65.3	58.9	59.9	84	37	67.2	53.3	52	52	53	52	88	64	82	78	6.74	2.40
A ..	30.023	30.29	29.66	62.0	73.2	64.2	66.5	86	44	74.8	59.2	57	56	58	57	83	57	82	74	3.08	1.35
M .	29.989	30.21	29.76	70.8	83.2	73.3	75.8	92	56	85.0	66.9	64	62	66	64	78	52	77	69	2.81	1.18
J ..	29.952	30.13	29.78	78.4	86.0	77.7	80.7	94	67	88.6	73.9	72	72	72	72	82	65	85	77	4.78	2.26
J ..	29.957	30.15	29.73	78.7	86.1	77.9	80.9	94	70	89.3	74.5	74	74	74	74	86	68	87	80	14.97	3.51
A ..	29.970	30.19	29.77	77.6	85.7	78.0	80.4	94	65	88.8	74.5	74	73	74	74	89	68	87	82	6.25	3.01
S ..	30.045	30.18	29.85	75.5	83.4	76.8	78.6	92	66	85.4	73.5	72	72	73	72	90	69	88	82	4.91	2.04
O ..	30.090	30.23	29.92	64.1	75.2	67.3	68.9	87	44	77.9	62.5	60	63	62	62	87	68	85	80	2.47	1.09
N ..	30.133	30.35	29.87	51.4	68.5	57.4	59.1	82	35	71.6	48.6	47	52	53	51	85	57	85	76	.97	.79
D ..	30.107	30.38	29.60	47.1	60.5	50.7	52.8	76	27	62.9	44.4	44	51	47	47	89	72	88	83	3.20	1.12
Y ..	30.035	30.58	29.48	62.9	73.7	65.3	67.3	94	15	76.1	60.0	58	60	60	60	86	64	85	78	54.86	.....

KEELER, CAL.

[Latitude, 36° 35′ N.; longitude, 117° 50′ W.]

J ..	26.336	26.64	25.80	38.4	46.3	43.6	42.8	67	26	51.4	34.5	30	32	30	31	73	59	61	64	.49	.17
F ..	26.386	26.70	25.85	44.0	55.6	52.8	50.8	73	31	62.6	40.7	31	36	32	33	60	50	47	52	.14	.14
M .	26.266	26.52	25.71	41.0	52.0	49.6	47.5	71	27	58.3	38.0	26	29	27	27	57	44	45	49	.60	.60
A ..	26.197	26.51	25.82	47.9	61.1	57.8	55.6	80	35	67.3	45.5	32	38	37	36	56	45	48	50	.40	.40
M .	26.272	26.51	26.07	59.0	74.9	71.3	68.4	91	46	80.7	56.4	35	36	31	34	43	26	24	31	.00	.00
J ..	26.226	26.36	25.82	65.8	82.1	79.5	75.8	98	48	89.5	63.5	43	47	42	44	46	31	28	35	.00	.00
J ..	26.254	26.42	26.08	70.9	86.2	82.7	79.9	100	58	93.4	68.1	45	50	49	48	42	32	33	36	.14	.09
A ..	26.256	26.38	26.10	73.8	87.9	82.9	81.5	103	65	94.0	71.3	53	53	54	53	50	33	39	41	.08	.08
S ..	26.276	26.40	26.03	65.3	79.5	77.4	74.1	94	53	87.3	62.0	39	43	36	40	40	29	25	31	.00	.00
O ..	26.317	26.59	25.99	51.3	64.0	59.2	58.2	81	34	68.6	46.8	24	26	24	25	36	25	28	30	.01	.01
N ..	26.436	26.75	25.78	39.0	49.9	46.3	45.1	68	24	56.3	35.7	22	24	18	21	52	37	34	41	.08	.08
D ..	26.447	26.72	26.08	39.9	48.6	45.7	44.7	62	30	54.7	36.1	26	30	24	26	58	48	43	50	.00	.00
Y ..	26.306	26.75	25.71	53.0	65.7	62.4	60.4	103	24	72.0	49.9	34	37	34	35	51	38	38	42	1.94	.....

KEOKUK, IOWA.

[Latitude, 40° 22′ N.; longitude, 91° 26′ W.]

J ..	29.413	29.90	28.82	11.4	18.0	14.5	14.6	52	-19	22.9	7.0	9	14	12	11	89	82	88	87	2.08	.48
F ..	29.410	30.00	28.78	21.2	30.9	26.9	26.3	56	-18	36.6	17.7	17	2	22	20	83	68	82	77	1.40	.88
M	29.297	29.88	28.66	30.9	42.1	36.5	36.5	76	12	45.8	29.0	26	30	30	29	84	66	78	76	2.25	.81
A ..	29.321	29.69	28.87	47.0	60.6	53.1	53.6	82	24	63.8	45.1	42	45	45	44	84	58	76	72	1.52	.47
M .	29.279	29.63	28.85	57.0	71.8	63.5	64.1	86	40	75.7	53.8	52	53	55	54	85	55	74	72	4.49	1.26
J ..	29.297	29.65	29.05	63.7	78.7	69.7	70.7	89	46	81.9	60.5	58	60	61	60	83	53	75	70	2.86	2.48
J ..	29.293	29.47	29.07	68.1	87.8	76.7	77.5	97	58	90.5	65.0	60	62	62	61	77	42	62	60	.65	.57
A ..	29.293	29.49	29.08	69.6	86.0	75.8	77.1	99	53	88.1	67.8	63	62	63	63	79	47	67	64	5.90	3.90
S ..	29.363	29.65	29.06	61.9	75.6	67.0	68.2	92	42	77.8	59.9	56	57	58	57	82	55	75	70	3.95	1.26
O ..	29.497	29.86	28.68	49.9	66.1	56.9	57.6	81	33	68.1	48.7	44	47	46	45	79	51	68	66	2.38	.97
N ..	29.365	29.78	28.75	33.7	44.0	37.7	38.5	69	15	47.6	31.4	28	31	29	29	80	62	72	71	1.15	.37
D ..	29.521	30.00	28.99	16.7	26.3	20.7	21.2	55	-15	30.1	13.3	12	19	16	16	83	73	82	80	1.03	.42
Y ..	29.363	30.00	28.66	44.3	57.3	49.9	50.5	99	-19	60.7	41.6	39	42	42	41	82	59	75	72	29.66	.....

Monthly and yearly meteorological summaries—Continued.

INDIANOLA, TEX.

[H=26. T=29. h=40.]

Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Wind. Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.0	5.1	4.1	4.4	12,203	60	N.	N.	29	15	10	8	10	8	3	8	2	12	11	8	2	9	1	9	0	0	0	J.
3.6	4.0	3.2	3.6	11,156	48	SW.	E.	14	7	22	11	16	9	1	3	1	15	7	6	0	7	0	2	0	0	0	F.
6.2	5.7	4.8	5.6	11,491	44	E.	N., E.	23	7	23	17	19	3	0	1	0	6	14	11	0	12	0	0	0	0	0	M.
6.3	4.8	3.7	4.9	10,108	46	N.	E., S.	11	4	24	23	24	1	1	0	2	10	10	10	0	6	0	0	0	1	0	A.
3.5	3.6	2.0	3.0	10,275	40	E.	S.	5	4	8	19	40	10	2	1	4	16	15	0	0	2	0	0	5	1	0	M.
4.4	4.6	3.7	4.2	8,029	49	NE.	S.	9	8	13	13	27	12	2	2	4	8	20	2	0	10	0	0	13	8	0	J.
4.2	5.1	1.9	3.7	7,794	40	E.	S.	3	0	14	26	31	11	5	1	2	10	19	2	0	9	0	0	18	5	0	J.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	A.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	S.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	O.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	N.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	D.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Y.

JACKSONVILLE, FLA.

[H=43. T=68. h=56.]

6.0	6.2	5.7	6.0	5,865	37	SW.	W.	9	16	2	6	5	12	25	13	5	5	11	15	0	10	1	5	0	0	0	J.
4.3	4.6	3.0	4.0	3,913	30	SW.	NE.	7	23	5	6	3	9	8	17	6	12	10	6	0	7	0	2	0	0	0	F.
6.3	7.2	5.7	6.4	5,213	34	W.	NW.	10	10	2	5	19	6	15	20	6	3	16	12	0	19	0	0	0	2	0	M.
4.0	5.2	3.7	4.3	5,526	36	S.	NE.	2	25	10	11	11	3	17	2	9	14	10	6	0	9	0	0	0	1	0	A.
2.5	5.3	3.0	3.6	4,619	27	SW., SE.	SW.	0	6	6	18	11	19	15	9	9	15	11	5	0	5	0	0	4	3	0	M.
4.6	7.9	4.8	5.8	4,675	36	S.	SE.	1	15	10	22	12	17	4	2	7	3	22	5	0	16	0	0	11	6	0	J.
6.3	8.2	5.6	6.7	4,483	28	SE.	SW.	1	3	5	14	19	37	2	2	10	2	17	12	0	26	0	0	13	14	0	J.
4.4	6.9	4.0	5.1	4,092	25	SW.	SE.	6	14	2	24	15	23	2	0	7	6	18	7	0	15	0	0	14	4	0	A.
4.9	6.8	3.2	5.0	3,670	24	E.	NE.	1	42	16	4	2	6	0	2	17	8	15	7	0	14	0	0	3	2	0	S.
3.9	5.5	3.2	4.2	4,571	20	NE.	NE.	12	35	13	2	2	4	6	10	9	13	12	6	0	10	0	0	0	0	0	O.
2.5	2.9	1.8	2.4	3,665	28	W.	NW.	8	8	6	6	9	10	9	15	19	23	5	2	0	3	0	0	0	0	0	N.
4.9	5.5	3.2	4.5	3,885	26	SW.	NE.	6	26	0	2	4	9	17	13	16	10	13	8	0	12	0	4	0	1	0	D.
4.6	6.0	3.9	4.8	54,177	...	....	NE.	63	223	77	120	112	155	120	105	120	114	160	91	0	146	1	11	45	33	0	Y.

KEELER, CAL.

[H=3,622. T=20. h=2.]

1.9	4.0	2.9	2.9	2,865	36	S.	SW.	14	6	7	3	7	19	4	8	25	20	8	3	0	7	0	12	0	0	0	J.
0.0	2.7	1.1	1.3	3,504	26	NW.	SW.	15	13	15	3	8	16	0	7	7	23	5	0	0	1	0	1	0	0	0	F.
1.2	2.9	2.3	2.1	5,157	38	NW.	SW.	12	14	9	4	5	17	2	13	17	22	8	1	0	1	0	6	0	0	0	M.
0.8	1.4	0.8	1.0	6,375	40	NW.	SW.	12	12	9	12	5	25	0	7	8	25	4	1	0	1	0	0	0	0	0	A.
0.9	1.9	1.4	1.4	5,161	35	NW.	SW.	13	7	15	17	4	23	8	3	3	25	5	1	0	0	0	0	3	0	0	M.
0.0	0.8	0.3	0.4	4,623	36	NW.	SW.	10	9	12	12	9	17	8	7	6	30	0	0	0	0	0	0	15	0	0	J.
0.4	1.6	0.5	0.8	3,963	40	NE.	SW.	15	6	17	9	6	23	6	2	9	28	3	0	0	2	0	0	28	1	0	J.
1.6	2.6	1.0	1.7	4,438	29	S.	SW.	18	6	10	15	7	22	9	3	3	25	6	0	0	1	0	0	26	0	0	A.
0.0	0.3	0.1	0.1	3,737	29	S.	E.	10	9	26	5	4	15	9	3	9	30	0	0	0	0	0	0	11	0	0	S.
1.4	2.8	1.9	2.0	5,512	40	SW.	SW.	12	9	9	6	9	15	7	11	15	24	6	1	0	1	0	0	0	0	0	O.
1.2	2.4	1.8	1.8	3,457	39	NW.	SW.	12	10	13	4	5	16	4	9	17	23	6	1	0	2	0	8	0	0	0	N.
2.4	3.7	2.4	2.8	1,959	29	S., NW.	SW.	6	6	9	5	7	14	4	7	35	16	14	1	0	0	0	2	0	0	0	D.
1.0	2.3	1.4	1.6	50,751	...	... .	SW.	149	107	151	95	76	222	61	80	154	291	65	9	0	16	0	29	83	1	0	Y.

KEOKUK, IOWA.

[H=618. T=47. h=60.]

5.9	5.9	5.7	5.8	6,442	24	NW.	NW.	9	8	12	10	9	6	12	26	1	6	12	13	0	14	25	29	0	0	0	J.
5.2	5.1	3.1	4.5	6,315	31	E.	NW.	10	4	4	9	14	11	7	20	5	10	14	4	0	9	9	23	0	0	0	F.
5.3	5.9	5.5	5.6	7,091	28	SW., NW. E	NW.	12	13	11	9	10	9	10	18	1	10	11	10	0	11	3	22	0	3	0	M.
5.1	5.7	3.9	4.9	7,191	37	SE.	SE.	9	16	14	19	11	8	3	8	2	8	15	7	0	12	0	6	0	4	0	A.
3.4	4.9	2.5	3.6	4,539	26	E.	E.	13	11	14	13	13	11	2	8	8	15	11	5	0	9	0	0	0	5	0	M.
2.9	5.0	2.2	3.4	4,540	27	S.	N., NE., S. NW.	12	12	9	9	12	9	6	12	9	16	11	3	0	5	0	0	0	3	0	J.
2.0	1.7	1.0	1.6	4,192	19	SW.	S.	17	13	12	6	19	11	6	2	7	23	8	0	0	2	0	0	16	1	1	J.
3.4	3.0	2.2	2.9	5,273	60	NW.	S.	16	8	13	10	19	16	2	8	1	18	10	3	0	10	0	0	12	10	0	A.
4.4	4.2	4.1	4.2	6,331	32	SE.	S.	10	0	11	13	24	13	5	9	5	12	13	5	0	12	0	0	1	7	0	S.
3.5	3.1	2.0	2.9	5,595	31	W.	S.	9	4	3	15	31	13	2	15	1	17	11	3	0	5	0	0	0	2	0	O.
4.9	4.3	3.8	4.3	7,369	30	SW., W.	NW.	10	5	6	7	15	10	15	21	1	10	13	7	0	9	5	17	0	0	0	N.
3.2	4.1	3.7	3.7	5,715	28	NW.	NW.	19	7	7	9	17	4	5	23	2	13	14	4	0	7	18	28	0	0	0	D.
4.1	4.4	3.3	3.9	70,593	...	....	S.	146	101	116	129	194	121	75	170	43	158	143	64	0	105	60	125	29	35	1	Y.

Monthly and yearly meteorological summaries—Continued.

KEY WEST, FLA.

[Latitude, 24° 34′ N.; longitude, 81° 49′ W.]

Months and year.	Pressure.			Temperature.						Mean.		Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	30.053	30.36	29.78	61.9	66.7	62.8	63.8	79	41	68.9	59.6	58	59	58	58	86	77	86	83	1.45	0.45
F ..	30.096	30.37	29.87	63.5	69.8	64.7	66.0	82	52	71.5	62.1	60	62	61	61	88	76	88	84	0.13	0.08
M	30.034	30.36	29.79	69.7	73.7	69.7	71.0	82	53	76.0	66.7	62	63	64	63	79	71	82	77	1.30	0.81
A ..	29.938	30.13	29.78	73.2	77.7	72.7	74.5	88	65	79.8	70.0	66	66	66	66	79	69	80	76	1.99	0.85
M .	30.030	30.15	29.88	78.2	81.6	77.0	78.9	91	69	84.8	75.2	70	68	69	69	76	65	77	73	0.11	0.08
J ..	29.961	30.13	29.84	83.0	89.9	81.1	84.7	100	74	92.5	78.3	76	76	75	76	79	64	81	75	2.51	1.08
J ..	30.009	30.17	29.84	83.7	91.2	82.2	85.7	99	72	94.0	79.0	77	77	76	77	80	64	83	76	6.72	2.78
A ..	29.968	30.15	29.71	83.3	89.7	81.8	84.9	100	73	91.4	79.2	76	76	75	76	78	65	81	74	4.54	2.86
S ..	29.985	30.11	29.83	80.6	86.7	80.2	82.5	97	70	89.2	77.1	74	73	73	74	80	66	80	75	7.10	1.80
O ..	30.001	30.14	29.75	77.1	80.2	77.5	78.3	91	68	82.3	74.9	70	69	70	70	80	70	78	76	3.32	1.76
N ..	30.107	30.24	29.98	71.2	76.1	72.2	73.2	90	64	78.0	70.0	66	64	65	65	82	67	78	76	0.13	0.07
D ..	30.114	30.31	29.90	65.6	70.1	66.7	67.5	82	55	72.8	63.5	61	62	61	61	86	75	83	81	0.83	0.41
Y ..	30.024	30.37	29.71	74.2	79.4	74.0	75.9	100	41	81.8	71.3	68	68	68	68	81	69	81	77	30.13	.....

KITTY HAWK, N. C.

[Latitude, 36° 0′ N.; longitude, 75° 42′ W.]

Months and year.	Pressure: Mean.	Pressure: Maximum.	Pressure: Minimum.	Temp.: 7 a. m.	Temp.: 3 p. m.	Temp.: 11 p. m.	Temp.: Mean.	Temp.: Maximum.	Temp.: Minimum.	Mean Maximum.	Mean Minimum.	Dew point: 7 a. m.	3 p. m.	11 p. m.	Mean.	Rel. hum.: 7 a. m.	3 p. m.	11 p. m.	Mean.	Precip.: Total.	Max. 24 hours.
J ..	30.040	30.76	29.07	35.8	38.8	37.6	37.4	62	10	43.5	31.8	30	32	33	32	81	78	84	81	6.23	2.41
F ..	30.113	30.58	29.45	35.8	40.9	37.7	38.1	67	5	46.4	31.2	29	31	31	30	78	70	78	75	4.38	1.64
M	29.996	30.38	29.39	43.8	50.2	45.7	46.6	73	27	54.9	39.6	36	38	39	38	76	66	78	73	4.90	1.43
A	30.090	30.44	29.49	52.9	56.8	52.9	54.2	84	39	60.9	48.6	47	48	48	48	82	75	86	81	5.00	1.62
M .	29.956	30.38	29.49	62.2	66.8	62.8	63.9	85	45	72.4	57.2	55	56	56	56	80	70	80	77	7.27	3.26
J ..	29.993	30.36	29.70	69.6	73.0	70.1	70.9	90	55	76.4	66.4	65	65	65	65	86	78	85	83	8.95	2.54
J ..	29.967	30.19	29.76	74.4	78.2	75.3	76.0	91	66	81.5	71.4	71	71	72	71	89	80	88	86	2.69	1.41
A ..	29.990	30.33	29.64	74.1	77.0	73.6	74.9	90	66	79.8	70.7	69	69	70	69	84	77	88	83	7.34	1.76
S ..	30.127	30.33	29.82	71.7	74.6	72.1	72.8	86	66	77.5	70.0	67	66	66	66	86	76	83	81	1.92	1.13
O ..	30.167	30.46	29.86	62.0	66.7	62.9	63.9	78	44	68.7	59.6	56	56	55	56	80	69	77	76	.02	0.02
N ..	30.102	30.42	29.62	50.9	57.8	53.4	54.0	76	33	57.9	46.3	42	45	44	44	74	64	74	71	1.39	0.50
D ..	30.128	30.48	29.53	40.7	44.9	42.0	42.5	66	21	50.1	36.1	38	39	38	38	89	82	85	85	3.89	1.06
Y ..	30.056	30.76	29.07	56.2	60.5	57.2	58.0	91	5	64.2	52.4	50	51	52	51	82	74	82	79	53.98	.....

KNOXVILLE, TENN.

[Latitude, 35° 56′ N.; longitude, 83° 58′ W.]

Months and year.	Pressure: Mean.	Pressure: Maximum.	Pressure: Minimum.	Temp.: 7 a. m.	Temp.: 3 p. m.	Temp.: 11 p. m.	Temp.: Mean.	Temp.: Maximum.	Temp.: Minimum.	Mean Maximum.	Mean Minimum.	Dew point: 7 a. m.	3 p. m.	11 p. m.	Mean.	Rel. hum.: 7 a. m.	3 p. m.	11 p. m.	Mean.	Precip.: Total.	Max. 24 hours.
J ..	29.034	29.59	28.33	28.4	38.1	31.4	32.6	61	−6	41.5	25.0	25	29	28	27	87	71	85	81	6.12	1.95
F ..	29.105	29.64	28.63	29.9	44.5	36.8	37.1	66	−4	47.3	26.8	26	28	28	27	85	58	71	71	2.62	0.93
M .	28.981	29.30	28.40	41.5	54.2	47.1	47.6	76	23	57.2	39.4	35	35	37	35	78	52	69	66	11.15	5.56
A ..	29.035	29.30	28.65	52.6	66.9	57.9	59.1	84	29	69.1	49.5	48	49	50	49	84	57	76	72	5.30	2.90
M .	28.982	29.23	28.61	60.3	74.6	65.6	66.8	88	44	77.0	56.5	56	58	59	58	87	58	80	75	4.92	0.96
J ..	28.979	29.12	28.77	67.7	76.7	70.0	71.5	91	55	80.3	63.8	64	66	66	66	90	71	88	83	4.62	0.87
J ..	28.976	29.14	28.78	69.0	81.8	72.8	74.5	94	57	84.6	65.0	66	67	68	67	91	63	87	80	6.25	1.31
A ..	29.009	29.23	28.78	69.3	82.7	72.4	74.8	93	58	84.9	65.7	66	68	68	68	91	63	88	81	5.17	1.00
S ..	29.120	29.31	28.87	64.2	80.2	68.9	71.1	90	52	81.7	60.9	61	63	64	63	90	57	85	77	1.88	0.95
O ..	29.191	29.41	28.80	47.8	69.9	54.7	57.5	83	32	71.5	45.8	46	56	51	51	94	63	86	81	0.87	0.54
N ..	29.094	29.40	28.63	39.4	54.5	44.2	46.0	72	24	56.8	36.1	36	43	40	39	87	67	84	79	7.21	1.90
D ..	29.125	29.39	28.64	30.5	40.4	33.9	34.9	58	6	42.9	26.6	26	30	29	28	85	69	82	78	5.34	1.54
Y ..	29.052	29.64	28.30	50.0	63.7	54.6	56.1	94	−6	66.2	46.8	46	49	49	48	87	62	82	77	61.45	.....

LA CROSSE, WIS.

[Latitude, 43° 49′ N.; longitude, 91° 15′ W.]

Months and year.	Pressure: Mean.	Pressure: Maximum.	Pressure: Minimum.	Temp.: 7 a. m.	Temp.: 3 p. m.	Temp.: 11 p. m.	Temp.: Mean.	Temp.: Maximum.	Temp.: Minimum.	Mean Maximum.	Mean Minimum.	Dew point: 7 a. m.	3 p. m.	11 p. m.	Mean.	Rel. hum.: 7 a. m.	3 p. m.	11 p. m.	Mean.	Precip.: Total.	Max. 24 hours.
J ..	29.289	29.75	28.67	9.0	15.6	13.1	12.6	37	−26	20.3	5.0	3	8	7	6	77	72	77	76	3.44	0.97
F ..	29.273	29.90	28.69	16.5	26.5	22.5	21.8	52	−28	31.6	13.2	10	18	15	14	76	71	72	73	0.81	0.37
M .	29.217	29.84	28.58	25.0	36.3	31.7	31.0	54	(*)	39.1	23.4	19	27	24	23	77	69	74	73	1.36	0.37
A ..	29.237	29.65	28.63	45.9	58.0	52.1	52.0	81	19	61.4	43.9	40	44	43	42	78	61	72	70	1.69	0.84
M .	29.186	29.53	28.88	55.5	69.9	62.3	62.6	84	40	71.5	53.0	48	53	52	51	77	55	71	68	0.89	0.22
J ..	29.209	29.50	28.95	62.8	76.8	67.8	69.1	94	47	78.4	60.1	57	62	61	60	82	61	80	74	1.89	0.94
J ..	29.211	29.44	28.93	68.1	83.1	74.1	75.1	95	57	85.1	65.7	62	69	67	66	83	63	78	75	1.77	0.80
A ..	29.202	29.44	28.97	66.1	80.7	72.1	73.0	91	46	82.3	64.6	61	70	66	66	85	71	82	79	3.90	0.94
S ..	29.235	29.53	28.84	56.5	67.3	61.6	61.8	90	36	70.7	54.4	52	57	56	55	85	72	81	80	3.21	0.76
O ..	29.362	29.89	28.56	47.0	62.2	54.8	54.7	81	27	64.5	46.0	41	49	47	46	81	63	75	73	1.71	0.66
N ..	29.220	29.69	28.46	28.8	37.5	32.9	33.1	68	7	41.4	26.6	23	28	25	25	79	69	72	73	1.32	0.42
D ..	29.392	29.99	28.83	12.5	20.2	15.7	16.1	48	−15	25.1	9.0	7	12	10	10	80	71	77	76	0.50	0.18
Y ..	29.253	29.99	28.46	41.1	52.8	46.7	46.9	95	−28	56.0	38.8	35	41	39	39	80	66	76	74	22.49	.....

* Zero.

Monthly and yearly meteorological summaries—Continued.

KEY WEST, FLA.

[H=22. T=47. h=58.]

Cloudiness (in tenths). 7 a.m.	3 p.m.	11 p.m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.1	6.3	5.1	6.2	8,639	30	NW.	NE.	15	27	10	10	5	2	2	22	0	3	18	10	0	8	0	0	0	0	0	J.
5.1	4.4	3.4	4.3	7,068	31	N.	NE.	26	30	5	11	2	0	1	6	3	10	15	3	0	3	0	0	0	0	0	F.
4.3	3.8	3.7	3.9	8,429	35	N.	SE.	15	13	17	22	6	5	0	8	1	13	12	4	0	6	0	0	0	2	0	M.
4.4	4.2	3.4	4.0	6,683	48	N.	NE.	11	18	8	8	4	3	3	2	0	6	12	1	0	10	0	0	0	2	0	A.
4.7	3.7	3.0	3.8	6,988	26	E.	N.	31	12	24	14	2	2	2	5	1	13	14	4	0	3	0	0	3	0	0	M.
6.2	5.7	5.3	5.7	7,433	40	S.	SE.	7	1	20	31	18	8	2	3	0	6	13	11	0	16	0	0	19	3	0	J.
6.8	7.1	6.3	6.7	6,454	52	SW.	E.	2	1	31	21	20	14	4	0	0	1	16	14	0	14	0	0	26	5	0	J.
6.0	5.3	3.5	4.9	8,488	40	E.	E.	1	11	39	20	4	9	6	1	2	5	20	6	0	14	0	0	19	3	0	A.
5.6	5.6	4.4	5.2	7,144	32	E.	E.	1	13	56	10	7	0	2	0	1	5	18	7	0	13	0	0	12	9	0	S.
6.0	6.2	3.8	5.3	9,902	30	{SE., S., NE.}	NE.	2	44	35	7	4	0	0	1	0	8	14	9	0	10	0	0	3	2	0	O.
5.4	5.0	3.5	4.6	9,591	29	N.	NE.	13	39	25	8	4	0	0	0	1	7	18	5	0	3	0	0	0	0	0	N.
5.5	5.2	3.3	4.7	8,156	41	NW.	NE.	16	35	21	6	3	2	4	4	2	9	19	3	0	4	0	0	0	1	0	D.
5.6	5.2	4.1	5.0	94,975	..	....	E.	140	244	291	168	79	45	26	52	11	86	189	77	0	104	0	0	82	27	0	Y.

KITTY HAWK, N. C.

[H=9. T=16. h=2.]

Cloudiness (in tenths). 7 a.m.	3 p.m.	11 p.m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.2	5.9	4.8	5.6	11,943	48	E.	N.	25	20	4	0	8	7	14	12	3	5	17	9	2	16	4	12	0	0	0	J.
4.1	3.4	2.7	3.4	10,486	48	N.	N.	19	14	5	6	13	12	5	9	1	15	10	3	1	9	2	14	0	0	0	F.
4.2	4.9	3.4	4.2	12,367	48	S.	SW.	10	21	9	2	9	25	9	8	0	14	10	7	0	9	0	6	0	0	0	M.
4.6	4.6	3.9	4.4	10,172	42	NE.	NE.	6	32	9	7	11	7	14	3	1	13	11	6	1	8	0	0	0	1	0	A.
5.5	4.2	3.5	4.4	11,494	56	N.	SW.	11	12	13	7	11	25	11	3	0	10	15	6	0	10	0	0	0	2	0	M.
6.7	5.6	4.5	5.6	10,179	40	NE.	NE.	5	23	19	9	7	14	12	1	0	7	14	9	0	13	0	0	1	3	0	J.
5.0	4.6	3.1	4.2	8,488	42	SE.	SW.	2	8	16	20	9	26	6	6	0	12	15	4	0	11	0	0	1	1	0	J.
6.1	6.7	4.8	5.9	10,659	44	NE.	NE.	2	32	6	13	6	18	14	2	0	6	15	10	0	17	0	0	1	2	0	A.
5.4	4.7	3.7	4.6	10,865	38	NE.	NE.	3	29	21	6	8	12	10	0	1	11	12	7	0	4	0	0	0	0	0	S.
4.3	3.5	2.4	3.4	10,605	37	NE.	NE.	9	30	12	8	6	1	9	17	1	15	14	2	0	0	0	0	0	0	0	O.
4.1	4.2	3.7	4.0	9,884	44	NW.	NW.	3	10	9	1	8	20	14	25	0	13	12	5	0	8	0	0	0	1	0	N.
5.5	5.4	4.2	5.0	11,045	52	NE.	NE.	16	23	3	0	7	11	15	16	2	7	18	6	0	13	0	8	0	0	0	D.
5.1	4.8	3.7	4.5	128,187	..	....	NE.	111	254	126	79	103	178	133	102	9	128	163	74	4	118	6	40	3	10	0	Y.

KNOXVILLE, TENN.

[H=980. T=72. h=77.]

Cloudiness (in tenths). 7 a.m.	3 p.m.	11 p.m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.5	6.8	5.9	6.7	4,437	32	W.	W.	19	11	11	6	4	8	26	4	4	6	8	17	0	21	5	17	0	0	0	J.
5.8	5.8	4.3	5.3	4,059	36	W.	N.	24	13	10	1	1	7	19	5	4	11	5	12	0	7	2	18	0	0	0	F.
7.2	6.6	4.6	6.1	5,620	38	W.	W.	19	15	6	2	2	6	39	2	1	5	14	11	0	14	0	7	0	2	0	M.
6.1	7.3	4.8	6.1	3,999	33	W.	W.	12	15	18	0	3	8	27	3	4	7	10	13	0	13	0	3	0	2	0	A.
4.6	6.7	2.9	4.7	3,993	27	SW.	W.	12	14	6	3	7	14	24	6	7	7	20	4	0	14	0	0	0	3	0	M.
7.2	8.2	5.5	7.0	3,195	24	NE.	W.	9	14	10	5	2	21	22	4	3	4	12	14	0	17	0	0	1	2	0	J.
5.3	6.9	2.5	4.9	2,755	26	N.	NE.	10	26	7	3	3	17	18	4	5	8	16	7	0	12	0	0	3	7	0	J.
4.2	7.5	3.6	5.1	2,627	32	N.	NE.	15	23	6	2	3	13	17	3	11	8	16	7	0	13	0	0	5	7	0	A.
4.7	6.4	2.8	4.6	2,545	20	NE.	NE.	9	22	9	2	7	14	6	5	16	12	11	7	0	6	0	0	1	2	0	S.
3.5	2.9	2.5	3.0	2,267	28	W.	NE.	14	16	2	4	3	8	9	6	31	19	7	5	0	4	0	0	0	1	0	O.
5.0	5.4	4.6	5.0	4,262	42	W.	SW.	9	8	3	5	2	19	18	12	14	10	10	10	0	11	0	11	0	0	0	N.
4.4	5.0	5.2	4.9	3,878	22	{W., NW.}	NE.	7	34	10	2	2	7	16	8	7	9	15	7	0	15	4	20	0	0	0	D.
5.4	6.3	4.1	5.3	43,637	..	....	W.	159	211	98	35	39	142	241	62	107	106	144	114	0	147	11	76	10	26	0	Y.

LA CROSSE, WIS.

[H=725. T=40. h=67.]

Cloudiness (in tenths). 7 a.m.	3 p.m.	11 p.m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.5	6.9	5.9	6.4	5,519	24	N.	N.	27	10	1	6	17	4	11	16	1	6	13	12	0	22	25	30	0	0	0	J.
5.6	5.2	4.6	5.1	6,280	35	NW.	S.	15	4	2	4	26	5	13	14	1	8	10	10	0	10	11	25	0	0	0	F.
5.9	5.5	4.5	5.3	6,317	42	N.	N.	27	19	4	2	16	5	9	11	0	10	10	11	0	15	5	26	0	2	0	M.
5.0	5.9	4.4	5.1	5,853	25	NW., S.	S.	12	6	7	11	29	10	3	12	0	11	7	12	0	13	1	5	0	4	0	A.
3.8	4.7	2.4	3.6	5,024	32	NW.	S.	13	3	2	7	26	9	15	18	0	13	17	1	0	9	0	0	0	7	0	M.
4.3	5.0	3.0	4.1	5,201	28	NW.	S.	16	2	0	3	30	10	7	22	0	10	16	4	0	10	0	0	1	7	0	J.
3.3	3.3	2.3	3.0	4,702	24	S., W.	S.	19	0	0	1	32	9	12	19	1	14	16	1	0	7	0	0	6	5	0	J.
4.9	3.7	3.0	3.9	4,465	36	NW.	S.	13	2	1	6	34	10	9	18	0	11	18	2	0	7	0	0	4	6	1	A.
5.5	5.9	5.0	5.5	5,783	32	NW.	S.	6	3	0	6	42	7	14	12	0	4	19	7	0	11	0	0	1	6	0	S.
3.2	4.3	2.8	3.4	6,013	27	NW.	S.	6	5	1	7	45	9	7	11	2	14	13	4	0	6	0	3	0	1	0	O.
5.2	5.6	4.4	5.1	5,994	36	S.	S.	12	4	5	4	22	8	16	19	0	8	14	8	0	8	5	21	0	0	0	N.
6.0	5.2	4.3	5.2	5,437	28	N.	N.	29	1	2	2	28	5	13	13	0	8	13	10	0	10	22	28	0	0	0	D.
4.9	5.1	3.9	4.6	66,588	..	....	S.	195	59	25	59	347	91	129	185	5	117	166	82	0	128	69	138	12	38	1	Y.

Monthly and yearly meteorological summaries—Continued.

LAMAR, MO.

[Latitude, 37° 32′ N.; longitude, 94° 15′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.014	29.58	28.50	15.0	24.1	18.9	19.3	62	−16	28.7	10.2	13	17	15	15	91	74	86	88	2.91	0.98
F ..	29.015	29.57	28.35	28.0	39.4	33.0	33.5	63	−10	43.0	23.2	23	25	26	24	79	60	76	71	1.22	0.42
M .	28.906	29.30	28.41	36.7	48.9	42.1	42.6	81	17	53.2	33.5	30	30	32	31	79	55	72	69	1.94	0.48
A ..	28.915	29.28	28.54	47.8	62.9	53.8	54.8	84	24	66.1	45.9	44	48	46	46	86	61	75	74	1.78	0.84
M .	28.882	29.18	28.52	61.7	79.1	68.2	69.7	90	44	81.7	58.6	56	57	59	57	82	49	74	68	3.59	1.77
J ..	28.915	29.22	28.68	64.2	78.6	69.4	70.7	89	50	81.2	62.0	58	59	61	59	82	53	75	70	4.73	2.23
J ..	28.912	29.11	28.71	68.7	87.8	75.5	77.3	96	61	89.8	66.9	62	64	64	63	79	48	70	66	2.19	2.00
A ..	28.917	29.06	28.74	69.0	85.8	74.6	76.5	97	54	87.6	67.9	64	64	66	65	85	51	76	71	4.37	3.64
S ..	28.994	29.24	28.66	63.0	79.8	66.9	69.9	91	42	81.9	60.3	59	59	60	59	86	51	78	72	5.96	1.92
O ..	29.101	29.42	28.48	50.5	70.2	56.9	59.2	84	28	72.0	48.4	47	48	49	48	88	47	76	70	2.29	1.46
N ..	28.988	29.43	28.45	36.4	51.3	40.5	42.7	74	14	54.0	32.1	32	30	31	31	84	50	70	68	1.68	0.78
D ..	29.077	29.53	28.68	23.4	34.5	25.8	27.9	62	−2	38.2	19.4	21	19	20	20	88	58	79	75	0.82	0.40
Y ..	28.969	29.58	28.35	47.0	61.9	52.1	53.7	97	−16	64.8	44.0	42	43	44	43	84	55	76	72	33.48	.....

LAS ANIMAS, COLO.

[Latitude, 38° 4′ N.; longitude, 103° 12′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
J ..	26.013	26.29	25.66	12.1	25.6	15.9	17.9	52	−21	29.6	6.9	10	18	14	14	92	74	94	87	0.68	0.36
F ..	26.063	26.47	25.46	27.1	50.6	35.4	37.7	71	8	55.2	24.5	23	28	27	26	85	45	74	68	0.13	0.13
M .	25.946	26.25	25.53	28.0	50.7	37.5	38.7	81	1	54.9	25.2	22	25	26	24	78	43	66	63	0.33	0.12
A ..	25.966	26.33	25.51	37.6	59.8	47.3	48.2	85	9	64.4	35.9	32	35	35	34	83	45	65	64	2.64	1.16
M .	26.071	26.33	25.71	51.4	80.7	64.7	65.6	97	36	83.8	49.5	41	46	43	43	70	31	48	50	0.25	0.23
J ..	26.083	26.35	25.69	58.3	82.4	68.1	69.6	98	48	85.9	56.2	53	56	55	55	84	43	65	64	1.19	0.58
J ..	26.062	26.26	25.84	65.1	91.2	75.2	77.2	104	56	93.9	63.6	58	61	60	60	79	39	62	60	4.66	2.02
A ..	26.061	26.28	25.88	63.2	87.6	73.3	74.7	100	50	91.1	62.5	58	58	58	58	83	39	60	61	1.17	0.74
S ..	26.048	26.40	25.68	52.1	79.0	63.1	64.7	94	33	82.4	50.8	47	50	50	49	82	40	64	62	1.23	1.02
O ..	26.076	26.55	25.72	41.3	70.6	53.6	55.2	89	24	74.0	38.9	36	46	42	41	82	43	66	63	0.20	0.18
N ..	26.061	26.45	25.47	20.5	47.7	28.8	32.3	75	− 6	51.7	17.2	18	30	23	24	90	54	80	75	0.23	0.17
D ..	26.062	26.48	25.73	17.7	45.7	25.3	29.6	71	1	49.6	14.2	16	33	22	23	92	62	86	80	0.07	0.06
Y ..	26.043	26.55	25.46	39.5	64.3	49.0	50.9	104	−21	68.0	37.1	34	40	38	38	84	46	69	66	12.78	.....

LEAVENWORTH, KANS.

[Latitude, 39° 19′ N.; longitude, 94° 57′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
J ..	29.235	29.80	28.64	10.1	18.6	14.4	14.4	45	−20	23.0	5.8	5	11	9	8	80	71	79	76	1.60	0.51
F ..	29.202	29.80	28.52	23.5	37.1	29.9	30.2	61	−10	41.0	21.0	18	26	23	22	78	64	74	72	0.61	0.20
M	29.099	29.58	28.61	32.5	46.6	38.6	39.2	80	9	48.9	30.9	26	34	31	30	78	62	74	71	1.35	0.41
A ..	29.106	29.50	28.67	46.5	62.5	54.2	54.4	87	20	65.2	45.5	41	47	46	44	80	58	74	71	1.47	0.48
M .	29.073	29.38	28.62	60.2	77.0	67.1	68.1	92	43	81.0	57.1	55	60	60	58	84	58	78	74	4.71	1.80
J ..	29.103	29.47	28.83	64.9	80.0	68.8	71.2	92	54	83.1	61.9	60	63	63	62	84	57	83	75	4.93	1.01
J ..	29.083	29.25	28.88	69.9	89.1	76.3	78.4	100	59	91.8	67.2	63	66	66	65	79	48	72	66	0.55	0.55
A ..	29.078	29.24	28.88	70.4	89.5	76.5	78.8	107	52	92.0	68.8	64	66	67	66	82	48	72	67	0.73	0.31
S ..	29.134	29.41	28.77	62.7	80.4	68.4	70.5	97	41	83.4	61.0	57	58	58	58	82	48	70	67	2.75	1.76
O ..	29.257	29.67	28.70	50.4	70.5	58.3	59.7	86	27	72.7	48.9	46	49	49	48	86	49	72	69	1.80	0.88
N ..	29.159	29.58	28.58	33.4	48.2	38.5	40.0	77	15	51.6	30.9	26	29	30	28	73	50	72	65	1.10	0.83
D ..	29.299	29.80	28.89	18.2	29.8	23.2	23.7	59	−10	33.0	15.4	13	18	18	16	81	64	79	74	0.65	0.54
Y ..	29.152	29.80	28.52	45.2	60.8	51.2	52.4	107	−20	63.9	42.9	40	44	43	42	81	56	75	71	22.25	.....

LITTLE ROCK, ARK.

[Latitude, 34° 45′ N.; longitude, 92° 6′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
J ..	29.784	30.38	29.33	25.7	32.1	29.4	29.1	61	−5	36.1	23.6	23	25	25	24	90	76	84	83	3.97	1.55
F ..	29.801	30.36	29.22	33.7	47.7	41.0	40.8	72	8	51.1	31.2	29	34	32	32	84	62	72	72	4.27	1.84
M .	29.686	30.05	29.12	42.9	54.2	48.9	48.7	79	23	58.5	40.6	38	39	40	39	84	61	73	73	3.45	1.19
A ..	29.681	29.95	29.30	53.9	69.0	59.7	60.9	85	28	70.7	51.7	48	49	50	49	84	52	71	69	3.09	1.08
M .	29.637	29.95	29.33	64.8	81.2	71.9	72.6	93	48	83.8	63.2	61	66	65	64	86	62	80	76	1.13	0.45
J ..	29.610	29.83	29.37	69.6	81.3	72.6	74.5	95	60	83.5	67.6	68	72	70	70	94	74	92	87	9.28	3.17
J ..	29.619	29.83	29.39	72.9	86.5	77.8	79.1	93	66	89.0	71.4	70	70	73	71	90	60	86	79	2.97	0.92
A ..	29.643	29.81	29.41	72.6	87.9	77.2	79.2	97	62	89.4	71.6	70	69	72	70	91	55	85	77	5.31	3.41
S ..	29.723	29.93	29.49	67.1	82.2	72.3	73.9	93	53	84.0	66.0	65	66	67	66	92	58	85	78	6.24	2.51
O ..	29.854	30.11	29.33	53.7	72.3	60.0	62.0	82	33	73.7	52.5	50	52	55	52	88	50	84	74	1.07	0.96
N ..	29.787	30.24	29.30	42.2	56.2	48.7	49.0	72	25	59.2	39.4	37	41	42	40	82	61	80	74	5.81	1.47
D ..	29.848	30.18	29.46	32.3	42.7	37.1	37.4	65	15	46.6	29.9	28	29	30	29	85	64	76	75	0.88	0.45
Y ..	29.723	30.38	29.12	52.6	66.1	58.0	58.9	98	−5	68.8	50.7	49	51	51	50	88	61	80	76	47.47	.....

Monthly and yearly meteorological summaries—Continued.

LAMAR, MO.

[$H=1,028.$ $T=60.$ $h=51.$]

Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.7	6.0	6.5	6.1	8,437	33	N.	NW.	15	7	6	15	10	9	5	26	0	9	7	15	0	14	17	29	0	1	0	J.
3.3	4.8	4.0	4.0	7,655	36	SW.	S.	11	6	5	11	18	9	9	14	0	12	10	5	0	8	6	19	0	0	0	F.
6.6	6.9	5.3	6.3	10,167	40	S., SW.	NW.	7	8	14	13	14	9	5	22	1	7	10	14	0	13	1	13	0	2	0	M.
5.2	5.6	3.7	4.8	8,260	32	NW., W.	SE.	5	14	7	25	15	7	6	11	0	11	9	10	0	10	1	6	0	7	0	A.
3.7	4.0	2.2	3.3	6,513	36	S.	S.	10	14	10	7	26	14	5	6	1	15	15	1	0	4	0	0	2	4	0	M.
4.1	6.6	3.0	4.6	5,468	28	NE.	NE.	16	22	15	17	6	5	3	6	0	10	13	7	0	8	0	0	0	6	0	J.
3.4	4.6	1.9	3.3	5,067	19	NE., SE.	SE.	6	14	22	32	11	4	2	2	0	17	10	4	0	4	0	0	16	0	0	J.
4.7	3.8	2.0	3.5	6,209	26	S.	S.	12	10	9	8	26	17	5	6	0	15	14	2	0	5	0	0	10	1	0	A.
4.3	4.7	3.3	4.1	6,471	28	SW.	S.	9	5	4	16	32	18	2	4	0	12	13	5	0	9	0	0	3	3	0	S.
2.0	4.2	2.1	2.8	5,945	32	SW.	S.	11	8	4	9	40	16	2	3	0	18	12	1	0	6	0	2	0	0	0	O.
4.1	5.5	2.7	4.1	8,089	38	W.	S.	14	9	5	2	18	15	15	12	0	15	10	5	0	6	0	17	0	0	0	N.
4.1	4.2	3.2	3.8	7,670	36	N., SW.	NE.	21	22	8	9	12	15	3	3	0	15	10	6	1	7	12	27	0	0	0	D.
4.3	5.1	3.3	4.2	85,951	...	....	S.	137	139	109	164	228	138	62	115	2	156	133	75	1	94	37	113	31	24	0	Y.

LAS ANIMAS, COLO.

[$H = 3,899.$ $T = 22.$ $h = 7.$]

Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.2	4.5	4.2	4.6	5,292	34	N.	W.	12	9	11	4	1	5	34	15	2	8	16	7	0	11	17	31	0	0	0	J.
2.9	4.4	3.2	3.5	5,527	41	NW.	W.	5	5	11	2	6	9	34	11	1	11	13	4	0	2	1	25	0	0	0	F.
4.1	4.9	3.9	4.3	7,516	40	N.	E.	10	10	17	8	5	14	15	13	1	11	15	5	0	8	1	25	0	0	0	M.
4.6	6.3	5.4	5.4	7,532	50	S.	E.	6	10	20	11	13	8	15	7	0	7	14	9	0	9	1	9	0	4	0	A.
3.0	4.0	2.4	3.1	6,200	44	NE., N.	W.	6	8	20	11	7	10	24	7	0	13	17	1	0	3	0	0	6	4	0	M.
3.4	4.1	3.9	3.8	5,821	40	NW.	E.	4	5	30	24	1	12	9	2	3	11	17	2	0	4	0	0	9	5	0	J.
3.3	3.1	3.8	3.4	5,021	39	N.	SE.	2	9	23	25	9	5	10	3	7	15	12	4	0	10	0	0	23	9	0	J.
3.3	2.7	3.8	3.3	4,477	36	NE.	E.	7	9	26	14	11	13	8	3	2	15	14	2	0	5	0	0	19	4	0	A.
3.0	2.9	3.1	3.0	4,263	36	N.	S., W.	5	8	13	12	15	10	15	5	7	16	10	4	0	4	0	0	9	5	0	S.
2.7	3.8	1.7	2.7	4,450	28	SW.	W.	5	4	15	12	11	15	22	3	6	16	14	1	0	3	0	6	0	1	0	O.
2.4	3.3	1.5	2.4	4,956	42	W.	W.	2	10	19	5	1	8	30	14	1	21	7	2	0	3	2	29	0	0	0	N.
3.3	4.5	2.6	3.5	4,001	44	N.	W.	11	9	8	3	6	9	29	9	9	16	12	3	0	2	2	31	0	0	0	D.
3.4	4.0	3.3	3.6	65,056	...	....	W.	75	96	213	131	86	118	245	92	39	160	161	44	0	64	24	156	66	32	0	Y.

LEAVENWORTH, KANS.

[$H = 842.$ $T = 56.$ $h = 50.$]

Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.8	6.5	6.0	6.1	5,455	24	NW.	NW.	25	4	0	11	11	2	1	37	2	9	7	15	0	14	21	31	0	0	0	J.
4.1	4.3	4.3	4.2	5,465	25	NW.	S.	19	0	3	9	25	1	3	23	1	12	9	7	0	7	5	23	0	0	0	F.
6.9	6.8	3.4	5.7	6,431	27	NW.	NW.	13	3	7	12	16	3	1	34	4	9	11	11	0	10	1	16	0	0	0	M.
6.7	6.9	4.6	6.1	6,000	32	S.	N., S.	20	2	5	15	20	2	4	16	6	6	10	14	0	13	0	5	0	4	0	A.
4.4	4.2	2.3	3.6	4,005	36	E.	N.	23	7	8	18	19	4	2	6	6	14	12	5	0	11	0	0	2	5	0	M.
4.6	5.1	3.0	4.2	3,509	28	S.	N.	23	7	3	19	18	2	3	12	3	10	16	4	0	13	0	0	4	5	0	J.
3.8	3.0	1.4	2.7	3,445	19	SE.	N.	26	3	13	19	19	0	1	6	6	17	12	2	0	2	0	0	21	0	0	J.
3.9	3.5	1.5	3.0	4,762	22	S.	S.	19	6	2	16	35	2	2	7	4	15	15	1	0	5	0	0	20	3	0	A.
5.2	4.6	2.3	4.0	5,436	22	NW.	S.	17	1	1	7	43	6	0	9	6	12	13	5	0	7	0	0	8	2	0	S.
3.5	4.1	2.0	3.2	4,847	28	S.	S.	6	0	0	11	51	2	1	12	10	19	7	5	0	6	0	2	0	0	0	O.
4.7	4.7	2.2	3.9	5,817	27	S.	NW.	18	2	3	5	21	2	6	30	3	12	14	4	0	5	1	19	0	0	0	N.
3.8	5.6	3.5	4.3	5,508	28	S.	N.	32	2	3	9	24	1	5	14	3	12	13	6	0	7	14	27	0	0	0	D.
4.8	4.9	3.0	4.2	60,680	...	....	S.	241	37	48	151	302	27	29	206	54	147	139	79	0	100	42	123	55	19	0	Y.

LITTLE ROCK, ARK.

[$H = 288.$ $T = 72.$ $h = 58.$]

Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.8	6.7	5.4	6.3	4,630	25	N.	NW.	16	4	18	10	5	6	6	25	3	6	11	14	1	13	8	28	0	1	0	J.
3.6	4.2	3.4	3.7	4,057	30	W.	E.	11	4	16	11	7	9	6	14	6	14	7	7	0	8	2	13	0	3	0	F.
6.3	6.0	4.3	5.5	5,787	25	W.	NW.	6	14	15	5	15	9	7	21	1	8	10	13	0	16	0	4	0	4	0	M.
7.0	5.8	4.0	5.6	4,739	32	SW.	S.	6	5	11	19	24	7	6	11	1	8	11	11	0	13	0	2	0	7	0	A.
4.7	6.0	2.5	4.4	4,443	23	SW.	S.	9	11	8	3	26	15	3	8	10	9	17	5	0	5	0	0	5	6	0	M
6.8	6.9	4.8	6.2	3,630	24	NW.	E.	7	16	25	11	12	2	3	8	6	6	12	12	0	16	0	0	2	11	0	J.
5.0	6.0	3.3	4.8	2,731	36	SW.	E.	7	13	19	13	7	11	2	5	16	9	16	6	0	12	0	0	10	6	0	J.
4.1	5.3	2.9	4.1	3,015	24	NW.	E.	8	11	15	9	8	13	1	12	16	12	15	4	0	8	0	0	13	6	0	A.
5.2	5.7	2.9	4.6	3,362	28	SW.	SE.	4	11	20	23	13	3	3	4	9	12	13	5	0	10	0	0	4	2	0	S.
3.2	3.1	1.5	2.6	2,151	18	NW.	NW.	8	7	10	12	4	2	1	13	36	16	14	1	0	3	0	0	0	0	0	O.
3.8	5.1	3.8	4.2	2,692	24	N.	S.	5	1	1	5	12	10	8	9	39	12	12	6	0	13	0	6	0	0	0	N.
4.7	5.4	5.2	5.1	4,926	28	NW.	NE.	10	18	8	16	6	3	9	14	9	12	7	12	0	12	5	17	0	1	0	D.
5.1	5.5	3.7	4.8	46,163	...	....	E.	97	115	166	137	139	90	55	144	152	124	145	96	1	129	15	70	34	47	0	Y.

Monthly and yearly meteorological summaries—Continued.

LOS ANGELES, CAL.

[Latitude, 34° 3′ N.; longitude, 118° 15′ W.]

Months and year.	Pressure.			Temperature.						Mean.		Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.702	29.98	29.32	49.9	61.2	53.0	54.7	75	32	63.6	47.0	44	48	49	47	82	65	87	78	7.78	3.77
F ..	29.671	29.90	29.39	52.0	69.0	57.4	59.5	81	41	71.6	48.5	46	55	52	51	81	62	84	76	1.41	1.32
M ..	29.680	29.91	29.33	47.3	63.2	52.5	54.3	76	37	65.6	45.3	44	50	49	48	90	63	90	81	2.52	.89
A ..	29.626	29.79	29.32	50.7	65.8	55.0	57.2	80	42	69.0	48.7	48	52	51	50	90	63	87	80	3.32	1.97
M ..	29.657	29.80	29.54	52.7	75.5	59.1	62.4	89	44	78.5	51.1	49	55	54	53	89	50	85	74	.01	.01
J ..	29.557	29.69	29.37	57.8	77.4	63.1	66.1	92	48	80.9	56.8	55	59	58	57	89	54	84	76	.11	.02
J ..	29.534	29.69	29.42	59.4	83.7	66.0	69.7	98	50	86.9	57.9	55	63	60	59	86	50	82	73	.27	.24
A ..	29.531	29.71	29.37	61.3	86.8	67.3	71.8	98	54	89.1	60.1	58	69	64	63	88	56	88	77	.21	.21
S ..	29.546	29.69	29.44	57.1	77.4	62.4	65.6	91	48	79.9	55.1	55	63	60	59	92	62	92	82	.11	.02
O ..	29.679	29.90	29.56	51.2	69.9	56.8	59.3	82	41	71.9	48.3	47	56	54	52	87	63	90	80	.02	.01
N ..	29.743	29.91	29.31	47.2	68.7	53.9	56.6	85	34	70.4	43.0	38	49	46	44	73	52	76	67	1.18	1.18
D ..	29.751	29.91	29.60	49.0	64.6	53.6	55.7	85	37	67.3	45.5	44	52	50	49	84	66	87	79	.26	.13
Y ..	29.640	29.98	29.31	53.0	71.9	58.3	61.1	98	32	74.6	50.6	49	56	54	53	86	59	86	77	17.20	....

LOUISVILLE, KY.

[Latitude, 38° 15′ N.; longitude, 85° 45′ W.]

J ..	29.482	30.02	28.85	28.4	33.8	30.9	31.0	62	–7	38.8	23.4	25	29	26	27	86	83	84	84	4.64	1.81
F ..	29.550	30.10	28.98	28.1	37.5	32.6	32.7	61	(*)	41.4	23.3	22	25	24	24	80	64	72	72	1.94	.71
M ..	29.407	29.87	28.71	38.5	49.8	43.4	43.9	77	22	52.7	35.3	32	32	32	32	78	53	66	65	3.42	.80
A ..	29.460	29.76	29.08	50.4	64.1	56.4	57.0	85	30	66.8	48.7	43	43	45	44	77	51	68	66	3.38	1.37
M ..	29.385	29.73	29.04	60.4	76.1	66.2	67.6	88	46	78.5	57.6	54	54	56	55	80	48	71	66	4.03	1.57
J ..	29.397	29.61	29.19	66.3	78.0	69.8	71.4	89	52	81.2	63.5	62	63	63	63	85	62	81	76	5.35	1.27
J ..	29.380	29.57	29.20	69.8	86.0	74.9	76.9	97	58	88.3	67.1	66	72	70	69	88	63	84	78	3.10	1.28
A ..	29.411	29.63	29.15	69.0	83.5	73.4	75.3	94	59	86.4	67.3	64	63	65	64	83	52	77	70	4.43	1.17
S ..	29.525	29.73	29.30	62.7	78.5	68.1	69.8	91	44	81.2	60.1	58	57	60	58	86	50	75	70	1.63	.47
O ..	29.623	29.89	29.00	49.6	68.9	56.8	58.4	83	30	70.6	47.5	44	43	46	44	81	41	69	64	.64	.31
N ..	29.490	29.90	29.89	38.9	49.7	43.0	43.9	75	22	53.7	34.0	33	32	34	33	79	57	71	69	5.72	1.39
D ..	29.577	29.89	29.06	27.1	35.7	31.3	31.4	62	5	39.7	23.0	21	25	23	23	79	66	72	72	2.69	.83
Y ..	29.474	30.10	28.71	49.1	61.8	53.9	54.9	97	–7	64.9	45.9	44	45	45	45	82	57	74	71	40.97	....

LYNCHBURG, VA.

[Latitude, 37° 25′ N.; longitude, 79° 9′ W.]

J ..	29.353	30.10	28.52	26.1	38.3	29.4	31.3	65	–3	40.2	23.3	22	27	25	25	82	65	84	77	4.56	1.15
F ..	29.400	29.92	28.79	28.4	43.9	34.7	35.7	65	1	46.9	26.4	24	28	29	27	82	56	80	73	3.81	1.32
M ..	29.275	29.75	28.70	39.3	53.6	43.9	45.6	78	23	55.0	36.7	33	36	36	35	78	54	75	69	5.79	1.57
A ..	29.386	29.74	28.76	49.7	66.3	55.2	57.1	89	31	68.7	46.0	45	47	49	47	84	53	80	72	4.82	1.78
M ..	29.262	29.63	28.89	60.0	74.3	62.6	65.6	91	45	76.4	55.1	56	56	58	57	86	56	87	76	6.74	2.36
J ..	29.305	29.57	28.99	66.8	77.2	67.5	70.5	88	52	79.6	62.7	63	67	66	65	87	71	94	84	8.48	1.73
J ..	29.278	29.53	29.05	69.5	83.5	71.0	74.7	95	60	85.9	65.4	66	70	69	68	90	64	94	82	3.31	1.70
A ..	29.322	29.64	29.03	68.8	82.1	70.4	73.8	92	57	84.2	65.7	66	68	68	67	91	64	92	82	4.29	1.11
S ..	29.460	29.72	29.10	63.9	78.1	66.6	69.5	91	50	80.3	60.5	61	66	64	64	91	66	93	83	1.74	.68
O ..	29.502	29.82	29.16	46.9	70.2	51.4	56.2	85	34	71.3	44.0	43	52	48	48	88	54	88	77	1.01	.82
N ..	29.375	29.77	28.94	40.3	54.1	43.5	46.0	73	24	57.6	36.8	34	35	37	35	79	54	80	71	4.49	1.27
D ..	29.436	29.81	28.86	28.3	40.0	31.3	33.2	56	15	42.6	25.7	23	28	26	26	82	64	81	76	2.81	.79
Y ..	29.362	30.10	28.52	49.0	63.5	52.3	54.9	95	–3	65.7	45.7	45	48	48	47	85	60	86	77	51.85	....

MACKINAW CITY, MICH.

[Latitude, 45° 47′ N.; longitude, 84° 39′ W.]

J ..	29.344	29.79	28.79	12.3	17.9	14.8	15.0	41	–16	21.9	6.6	5	10	8	8	73	72	74	73	2.25	.58
F ..	29.322	29.93	28.39	13.9	20.6	17.5	17.3	45	–19	25.9	7.3	5	13	9	9	69	72	70	70	1.19	.34
M ..	29.278	29.89	28.50	21.9	31.2	26.3	26.5	45	–5	33.2	17.6	14	22	20	18	71	70	75	72	1.97	.55
A ..	29.409	29.79	28.37	34.7	42.3	37.1	38.0	67	10	46.5	30.8	29	33	31	31	80	69	78	76	1.33	.54
M ..	29.261	29.58	28.92	46.9	55.5	47.3	49.9	76	32	60.1	40.7	40	40	40	40	78	58	76	70	1.01	.52
J ..	29.283	29.58	28.91	55.5	63.8	55.3	58.2	82	39	67.8	49.2	49	50	50	50	80	63	81	75	2.12	.66
J ..	29.284	29.55	29.03	61.8	72.2	62.3	65.4	92	47	75.6	56.2	55	56	55	56	80	59	79	73	1.18	.43
A ..	29.289	29.57	28.97	61.0	68.7	61.1	63.6	92	46	71.6	56.3	55	57	54	56	82	69	79	77	3.25	1.21
S ..	29.324	29.63	28.94	54.6	61.3	55.8	57.2	87	36	65.5	50.6	48	50	49	49	79	67	79	75	3.84	.88
O ..	29.449	29.95	28.30	47.0	54.9	48.9	50.3	76	28	57.7	42.7	41	43	42	42	80	65	78	74	3.13	1.49
N ..	29.243	29.72	28.38	33.0	37.0	33.7	34.6	72	12	40.7	28.8	25	27	26	26	74	69	72	71	1.33	.30
D ..	29.376	29.97	28.85	21.0	24.5	22.2	22.6	46	(*)	27.4	16.7	15	17	15	16	76	72	74	74	0.79	.50
Y ..	29.322	29.97	28.30	38.6	45.8	40.2	41.5	92	–19	49.5	33.6	32	35	33	33	77	67	76	73	23.39	....

* Zero.

Monthly and yearly meteorological summaries—Continued.

LOS ANGELES, CAL.

[$H=339$. $T=57$. $h=107$.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.8	4.9	4.3	4.7	5,228	37	W.	E.	10	22	26	8	2	7	9	6	3	13	6	12	0	10	0	0	0	1	0	J.
2.1	3.7	1.5	2.4	4,011	29	W.	NE.	9	25	15	11	4	2	10	8	0	20	4	4	0	2	0	0	0	0	0	F.
3.6	5.6	3.0	4.1	4,555	25	W.	W.	4	15	13	7	11	6	20	17	0	14	11	6	0	8	0	0	0	1	0	M.
5.1	5.4	3.0	4.5	4,528	28	SE.	W.	3	10	9	4	6	10	42	6	0	13	10	7	0	4	0	0	0	0	0	A.
4.0	4.0	1.5	3.2	4,285	20	W.	W.	2	12	7	2	4	9	47	8	2	14	14	3	0	0	0	0	0	0	0	M.
5.1	2.0	4.5	3.9	3,786	17	W.	W.	1	2	1	1	7	16	55	2	4	10	16	3	0	1	0	0	4	0	0	J.
3.8	1.6	3.1	2.8	4,035	22	N.	W.	1	4	1	0	0	11	65	9	2	15	14	2	0	1	0	0	9	1	0	J.
2.5	1.8	2.0	2.1	3,760	18	W.	W.	3	1	2	0	9	12	49	13	4	21	8	2	0	1	0	0	13	0	0	A.
4.5	.7	2.4	2.5	3,375	16	W.	W.	1	2	0	2	5	9	59	5	7	15	15	0	0	0	0	0	1	0	0	S.
3.5	2.5	3.7	3.2	4,076	24	W.	W.	4	11	12	3	4	13	37	9	0	15	14	2	0	1	0	0	0	0	0	O.
1.7	1.9	1.2	1.6	4,467	30	W.	NE.	4	34	9	7	10	8	13	5	0	22	7	1	0	1	0	0	0	0	0	N.
2.2	3.5	2.1	2.6	3,671	20	NW.	NE.	6	29	11	3	7	5	20	9	8	18	12	1	0	3	0	0	0	0	0	D.
3.6	3.1	2.7	3.1	49,777	..	....	W.	48	167	106	48	69	108	426	97	25	190	131	43	0	32	0	0	27	3	0	Y.

LOUISVILLE, KY.

[$H=551$, $T=102$. $h=93$.]

6.8	7.4	6.1	6.8	6,745	36	SW.	SW.	3	12	12	16	7	19	16	8	0	5	12	14	0	19	7	22	0	0	0	J.
4.3	5.9	3.9	4.7	5,943	33	W.	S.	14	4	3	11	17	13	12	7	3	10	11	7	0	9	6	20	0	0	0	F.
5.7	6.5	5.3	5.8	6,587	31	W.	SW.	15	17	2	4	14	19	9	8	2	10	8	13	0	12	0	10	0	1	0	M.
6.0	7.0	3.6	5.5	5,109	26	SW.	N.	15	8	14	14	5	13	10	4	7	10	10	10	0	18	0	6	0	4	0	A.
5.4	5.5	3.8	4.9	4,484	35	SW.	N., S.	17	6	4	5	17	13	7	10	14	9	16	6	0	14	0	0	0	8	0	M.
6.6	7.7	4.2	6.2	4,169	24	S.	N.	19	14	5	11	11	13	9	6	2	6	11	13	0	15	0	0	0	3	0	J.
2.6	5.6	2.0	3.4	3,484	24	NW.	NW.	18	12	5	2	13	9	5	21	8	18	9	4	0	7	0	0	12	4	0	J.
4.9	5.9	2.4	4.4	3,812	32	W.	N.	26	10	2	16	16	11	0	11	1	9	18	4	0	13	0	0	10	10	0	A.
4.1	5.9	3.7	4.6	3,745	26	NW.	S.	6	7	5	16	20	11	7	10	8	12	12	6	0	8	0	0	1	2	0	S.
2.8	3.3	2.5	2.9	3,255	38	SW.	N.	17	6	7	16	6	10	6	13	12	19	8	4	0	5	0	1	0	0	0	O.
5.4	5.7	4.9	5.3	5,287	26	SW.	SW.	6	3	3	7	15	25	16	13	2	7	13	10	0	13	0	12	0	1	0	N.
5.5	6.5	5.2	5.7	6,096	28	NW., SW.	SE.	14	13	4	16	13	8	9	15	1	9	10	12	0	15	7	25	0	0	0	D.
5.0	6.1	4.0	5.0	58,716	..	....	N.	170	112	66	134	154	164	106	126	63	124	138	103	0	148	20	96	23	33	0	Y.

LYNCHBURG, VA.

[$H=652$. $T=56$. $h=50$.]

6.6	6.8	5.3	6.2	3,182	17	SE.	NE.	5	22	10	4	6	16	18	12	0	4	15	12	0	15	9	25	0	0	0	J.
4.4	4.8	4.0	4.4	3,432	27	NW.	S.	0	7	4	2	23	15	13	19	1	9	13	6	0	7	2	20	0	0	0	F.
5.7	6.1	5.2	5.7	4,121	23	NW.	NW.	6	12	6	2	16	21	8	22	0	7	14	10	0	11	0	8	0	0	0	M.
4.6	6.8	5.2	5.5	2,884	15	NW.	NE.	3	28	16	6	12	9	12	2	2	8	12	10	0	12	0	1	0	1	0	A.
5.5	6.8	4.6	5.6	2,915	17	NW.	S.	4	11	8	4	24	15	8	19	0	7	18	6	0	16	0	0	1	5	0	M.
6.9	7.9	5.7	6.8	2,418	16	NW.	NE.	6	18	12	9	15	15	7	8	0	3	13	14	0	18	0	0	0	1	0	J.
3.8	6.1	5.1	5.0	2,322	23	NE.	S.	6	17	10	5	23	14	9	9	0	10	15	6	0	13	0	0	5	3	0	J.
5.8	6.6	5.0	5.8	1,816	14	NE.	E., NE.	4	17	17	6	9	16	9	10	5	6	16	9	0	14	0	0	3	3	0	A.
4.7	6.3	4.4	5.1	1,761	12	W., NE.	NE., S.	6	13	11	5	13	11	5	7	19	11	11	8	0	9	0	0	2	1	0	S.
3.4	3.0	1.3	2.6	1,921	16	N., NW.	E.	5	6	14	6	13	8	8	12	21	19	10	2	0	4	0	0	0	0	0	O.
5.0	5.2	3.9	4.7	2,596	22	SE.	SW.	4	3	4	3	10	25	15	11	15	9	15	6	0	9	0	6	0	1	0	N.
6.6	5.9	5.7	6.1	1,704	20	NW.	NW.	3	11	0	0	5	8	11	13	42	6	11	14	0	14	6	22	0	0	0	D.
5.2	6.0	4.6	5.3	31,072	..	....	SW.	52	165	112	52	169	173	123	144	105	99	163	103	0	142	17	82	11	15	0	Y.

MACKINAW CITY, MICH.

[$H=605$. $T=19$. $h=34$.]

7.0	7.1	6.5	6.9	8,156	36	NE.	NE., NW.	11	19	12	8	8	6	6	19	4	4	13	14	0	20	24	29	0	0	1	J.
6.4	6.0	4.6	5.7	7,087	39	E.	NW.	10	6	15	9	8	7	13	16	0	7	11	10	1	15	16	26	0	0	2	F.
6.4	6.6	5.1	6.0	8,102	36	SW.	E.	9	7	20	4	2	15	17	18	1	7	12	12	0	15	13	31	0	0	2	M.
5.3	5.1	3.7	4.7	5,694	30	NW.	E.	7	3	23	16	4	2	14	15	6	10	14	6	0	9	2	11	0	1	4	A.
5.5	4.4	3.7	4.5	6,611	30	S.	W.	4	3	10	10	4	11	25	22	4	7	20	4	0	9	0	0	0	3	2	M.
4.3	4.3	3.7	4.1	5,062	28	SW.	W.	3	2	17	9	5	8	22	18	6	10	17	3	1	10	0	0	0	1	2	J.
3.8	2.9	2.3	3.0	5,427	26	E.	W.	9	2	5	7	7	15	25	16	7	16	12	3	0	6	0	0	1	4	3	J.
4.0	4.2	2.5	3.6	5,616	24	W.	W.	7	5	11	9	10	7	21	20	3	17	9	5	0	9	0	0	1	3	4	A.
6.0	6.4	4.3	5.6	7,465	28	W., SW	SW.	3	2	12	13	7	20	19	14	0	6	15	9	0	17	0	0	0	2	3	S.
5.0	4.8	4.3	4.7	6,478	35	W.	SW.	10	2	11	6	7	25	17	8	7	11	11	9	0	10	0	3	0	2	6	O.
7.1	7.8	5.8	6.9	10,254	53	E.	W.	5	4	3	6	16	15	23	15	3	2	15	13	0	18	8	21	0	0	4	N.
6.3	7.9	6.2	6.8	9,719	36	W.	W.	6	1	4	7	16	13	27	19	0	2	16	13	0	14	22	26	0	0	2	D.
5.6	5.6	4.4	5.2	85,671	..	....	W.	84	56	143	104	94	144	229	200	41	99	165	101	2	152	85	147	2	16	35	Y.

Monthly and yearly meteorological summaries—Continued.

MARQUETTE, MICH.

[Latitude, 46° 34′ N.; longitude, 87° 24′ W.]

Months and year.	Pressure.			Temperature.						Mean.		Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.310	29.70	28.86	12.6	15.6	13.1	13.8	35	−18	22.3	8.2	10	12	10	11	90	88	88	89	3.14	0.58
F ..	29.268	29.87	28.57	11.8	18.3	14.7	14.9	50	−14	26.1	6.8	8	13	11	11	87	82	87	85	1.18	0.18
M .	29.246	29.87	28.54	20.3	28.4	23.6	24.1	52	− 3	34.6	17.2	15	18	17	17	80	71	78	76	2.19	0.88
A ..	29.337	29.73	28.64	37.2	44.4	38.2	39.9	79	7	49.9	31.4	32	34	33	33	82	68	82	77	2.14	0.78
M .	29.210	29.51	28.80	48.0	53.2	47.1	49.4	87	27	60.9	39.5	37	36	37	37	68	58	72	66	1.17	0.34
J ..	29.234	29.50	28.96	56.2	59.1	53.3	56.2	87	39	67.2	47.1	47	48	46	47	73	68	78	73	3.79	1.19
J ..	29.236	29.55	28.89	63.0	67.9	61.4	64.1	97	38	74.9	54.5	53	52	52	53	71	61	73	68	1.33	0.37
A ..	29.225	29.52	28.90	60.1	67.1	61.2	62.8	98	42	72.3	54.3	53	56	54	54	78	70	78	75	3.70	2.16
S ..	29.226	29.55	28.70	51.4	60.8	53.0	55.1	89	33	65.3	47.1	46	49	47	48	83	67	81	77	1.94	0.70
O ..	29.359	29.91	28.49	46.4	56.4	48.1	50.3	80	27	60.8	40.6	40	43	41	41	79	64	77	73	2.15	0.84
N ..	29.174	29.66	28.27	28.5	33.4	29.4	30.4	69	9	37.8	25.0	23	24	24	24	81	70	79	77	3.75	0.77
D ..	29.318	29.91	28.81	13.6	18.3	15.0	15.6	42	−12	22.5	9.4	9	12	10	10	81	75	81	79	2.79	0.79
Y ..	29.262	29.91	28.27	37.4	43.6	38.2	39.7	98	−18	49.5	31.8	31	33	32	32	80	70	80	76	29.27	....

MEMPHIS, TENN.

[Latitude, 35° 9′ N.; longitude, 90° 3′ W.]

J ..	29.768	30.33	29.34	26.4	32.8	29.7	29.6	60	− 8	36.9	23.3	22	24	25	24	84	73	84	80	4.55	1.62
F ..	29.806	30.38	29.31	34.0	45.5	40.1	39.9	65	6	48.2	32.2	27	29	29	28	77	57	67	67	6.43	1.69
M .	29.681	30.06	29.11	44.6	53.6	48.4	48.9	81	27	56.8	42.4	36	34	37	36	73	54	68	65	3.00	1.38
A ..	29.692	29.95	29.33	54.3	67.4	60.3	60.7	84	34	70.1	53.2	47	46	47	47	78	51	64	64	2.88	0.57
M .	29.645	29.94	29.38	65.3	78.5	70.7	71.5	90	51	81.2	62.9	58	58	60	58	78	50	70	66	2.11	0.71
J ..	29.617	29.83	29.43	70.7	81.8	72.8	75.1	93	63	84.2	68.6	66	66	66	66	86	60	81	76	8.06	3.47
J ..	29.625	29.84	29.40	73.9	87.7	77.7	79.8	96	64	89.5	71.3	69	68	71	69	84	53	81	72	5.52	3.70
A ..	29.649	29.84	29.41	73.2	86.1	77.0	78.8	98	60	88.2	71.6	69	67	70	69	87	56	79	74	6.49	3.27
S ..	29.743	29.91	29.51	67.3	81.3	71.7	73.4	91	53	83.6	66.0	63	64	66	64	87	56	82	75	6.20	1.80
O ..	29.855	30.08	29.23	53.8	72.4	60.6	62.3	85	34	73.8	52.8	48	48	52	50	81	44	75	67	0.59	0.52
N ..	29.778	30.21	29.26	43.6	56.2	49.7	49.8	75	30	58.8	41.0	38	38	40	39	80	54	72	68	8.89	3.24
D ..	29.836	30.14	29.40	33.2	41.8	37.0	37.3	66	17	45.4	30.4	28	28	29	28	81	62	73	72	3.00	0.86
Y ..	29.724	30.38	29.11	53.4	65.4	58.0	58.9	98	− 8	68.1	51.3	48	48	49	48	81	56	75	70	57.72	....

MILWAUKEE, WIS.

[Latitude, 43° 2′ N.; longitude, 87° 54′ W.]

J ..	29.266	29.78	28.63	14.2	18.5	14.7	15.8	45	−22	22.3	8.3	12	15	12	13	91	86	88	88	5.02	0.86
F ..	29.278	29.84	28.61	18.5	24.3	20.6	21.1	44	−16	28.9	13.7	16	19	17	17	88	81	85	85	2.36	0.43
M .	29.211	29.78	28.34	27.7	34.3	30.1	30.7	59	9	36.5	25.6	24	26	26	25	86	72	84	81	3.42	0.99
A ..	29.296	29.70	28.67	39.5	47.2	43.5	43.4	79	12	52.5	36.5	35	37	38	37	85	70	81	78	2.77	0.86
M	29.206	29.54	28.95	51.3	58.8	52.8	54.3	86	35	65.6	45.4	43	43	44	43	75	58	74	69	2.67	0.94
J ..	29.226	29.49	28.94	59.3	65.1	60.2	61.5	86	42	71.6	53.4	53	52	54	53	79	66	80	75	2.54	1.04
J ..	29.229	29.45	28.93	65.3	74.6	66.4	68.8	97	50	79.4	60.4	57	57	57	57	75	58	73	69	0.94	0.35
A ..	29.197	29.46	28.89	64.7	71.8	67.2	67.9	93	48	75.6	62.6	59	61	59	60	82	70	76	76	3.40	2.25
S ..	29.269	29.55	28.87	56.4	66.0	59.6	60.7	84	38	69.6	53.0	51	51	52	51	82	62	77	74	2.38	0.68
O ..	29.386	29.81	28.45	47.5	58.5	52.0	52.7	82	31	63.0	44.5	41	43	42	42	78	59	70	69	2.31	1.92
N ..	29.208	29.64	28.50	29.7	38.1	33.2	33.7	67	11	41.3	25.7	21	25	24	23	70	63	70	68	1.62	0.47
D ..	29.352	29.87	28.80	13.7	21.7	17.2	17.5	48	−17	25.5	9.0	10	16	13	13	84	78	82	81	2.03	0.43
Y ..	29.261	29.87	28.34	40.6	48.2	43.1	44.0	97	−22	52.6	36.5	35	37	36	36	81	69	78	76	31.46	....

MOBILE, ALA.

[Latitude, 30° 41′ N.; longitude, 88° 2′ W.]

J ..	30.065	30.60	29.58	40.5	48.4	43.3	44.1	68	11	51.7	35.7	36	38	38	37	87	69	82	79	6.12	2.15
F ..	30.125	30.63	29.79	43.9	56.0	49.3	49.7	71	19	58.4	40.5	40	41	42	41	88	60	77	74	2.15	1.06
M .	30.020	30.32	29.62	52.2	61.8	56.2	56.7	75	34	64.5	49.8	48	48	50	49	88	66	80	78	14.62	3.93
A ..	30.020	30.24	29.61	59.1	69.5	63.2	63.9	84	37	72.0	56.2	56	55	57	56	90	64	81	78	5.86	1.87
M .	29.990	30.17	29.77	66.5	78.7	71.4	72.2	89	52	80.6	63.7	63	60	64	63	88	56	79	74	1.27	0.86
J ..	29.918	30.12	29.80	74.8	82.7	76.1	77.9	94	65	86.3	71.8	72	71	72	72	90	70	88	83	5.94	1.32
J ..	29.936	30.14	29.74	75.1	83.1	77.6	78.6	93	65	87.2	72.8	72	71	72	72	91	69	85	82	6.59	1.54
A ..	29.953	30.17	29.74	75.2	86.3	78.2	79.9	97	67	89.0	73.3	72	70	72	71	89	61	81	77	3.55	0.69
S ..	30.032	30.14	29.92	72.6	83.9	76.2	77.6	92	55	86.3	71.4	69	67	69	68	87	59	80	75	2.69	1.17
O ..	30.113	30.31	29.82	59.3	76.5	66.5	67.4	89	37	77.7	58.1	54	54	56	55	83	47	70	67	0.13	0.12
N ..	39.142	30.46	29.75	49.4	63.9	55.0	56.1	76	30	66.3	45.8	45	45	47	46	85	57	75	72	3.36	1.07
D ..	30.132	30.37	29.75	43.9	55.4	47.3	48.9	69	23	58.1	39.8	40	40	41	40	88	60	79	75	1.97	0.88
Y ..	30.037	30.63	29.58	59.4	70.5	63.4	64.4	97	11	73.2	56.6	56	55	57	56	88	61	80	76	54.25	....

Monthly and yearly meteorological summaries—Continued.

MARQUETTE, MICH.

[$H=672.$ $T=68.$ $h=56.$]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
8.7	8.7	7.7	8.4	8,328	36	S.	NW.	10	10	7	4	12	4	22	24	0	2	5	24	0	26	24	31	0	0	0	J.
7.2	7.5	6.7	7.1	7,389	38	SW.	W.	1	13	5	7	8	9	22	19	0	4	9	15	0	15	18	28	0	0	0	F.
6.9	5.6	4.9	5.8	6,330	35	W.	W.	7	14	9	2	6	6	27	22	0	9	10	12	0	13	11	30	0	0	2	M.
5 4	4.7	4.8	5.0	4,947	29	NW.	NW.	4	15	9	6	16	6	10	21	3	11	10	9	0	14	2	12	0	1	1	A.
5.1	5.9	4.5	5.2	6,093	32	NW.	W.	13	3	9	7	5	9	24	22	1	8	15	8	0	11	0	3	0	2	1	M.
5.4	6.4	3.9	5.2	5,131	26	SW., W., NW.	NW.	9	5	9	7	6	10	15	29	0	7	17	6	0	14	0	0	0	6	1	J.
4.9	4.0	3.0	4.0	5,411	28	SW.	NW.	8	8	8	9	4	6	21	29	0	10	20	1	0	9	0	0	2	2	0	J.
5.3	4.5	4.6	4.8	5,922	25	W.	NW.	8	6	6	6	9	14	20	23	1	8	16	7	0	12	0	0	2	1	1	A.
6.1	7.1	5.1	6.1	7,093	30	S.	W.	2	2	6	5	15	17	29	13	1	5	11	14	0	13	0	0	0	1	0	S.
5.5	5.3	3.5	4.8	7,784	34	W.	W.	6	4	1	3	13	15	27	23	1	11	12	8	0	10	0	6	0	0	6	O.
7.8	7.0	5.9	6.9	8,320	39	E.	W.	5	2	5	3	7	6	38	24	0	3	12	15	0	17	8	26	0	0	0	N.
7.3	8.0	6.8	7.4	8,807	34	W.	W.	5	0	2	0	6	11	42	26	1	2	11	18	0	18	24	28	0	0	1	D.
6.3	6.2	5.1	5.9	81,505	...	....	W.	78	82	76	59	107	113	297	275	8	80	148	137	0	172	87	164	4	13	13	Y.

MEMPHIS, TENN.

[$H=320.$ $T=60.$ $h=51.$]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
6.9	6.8	6.0	6.6	4,928	30	NW.	NW.	4	5	11	16	2	4	22	29	0	4	13	14	0	14	6	25	0	0	0	J.
4.5	3.4	2.5	3.5	4,837	32	NW.	SE., NW.	2	15	3	18	3	8	13	18	4	16	6	6	0	10	3	10	0	0	0	F.
5.8	5.9	5.2	5.6	5,969	32	NW.	W.	5	19	4	16	4	9	20	16	0	9	11	11	0	11	0	3	0	1	0	M.
5.1	5.0	3.5	4.5	5,228	33	NW.	SE.	7	8	4	31	1	8	16	15	0	12	10	8	0	15	0	0	0	5	0	A.
4.6	3.1	2.0	3.2	5,159	32	SW.	NW., S.	7	10	1	9	17	14	14	17	4	18	9	4	0	11	0	0	0	10	0	M.
6.7	5.5	4.6	5.6	3,866	28	SW.	NW.	8	13	10	16	5	6	10	21	1	6	13	11	0	15	0	0	1	7	0	J.
3.7	2.2	1.4	2.4	3,200	26	N.	NW.	3	13	10	12	0	12	8	28	7	20	11	0	0	7	0	0	15	6	0	J.
4.0	4.0	2.5	3.5	4,041	24	NE., NW.	NW.	6	17	6	10	8	15	12	19	0	15	13	3	0	12	0	0	12	8	0	A.
5.4	4.1	2.3	3.9	4,157	36	SW.	SE.	7	19	11	23	3	7	5	13	1	14	11	4	0	10	0	0	2	6	0	S.
2.5	1.9	0.9	1.8	4,010	30	SE.	NW.	9	9	8	14	1	6	7	36	3	25	5	1	0	4	0	0	0	0	0	O.
4.8	5.4	3.9	4.7	4,945	34	W.	NW.	0	2	11	14	11	17	10	21	4	10	14	6	0	15	0	3	0	1	0	N.
5.1	5.3	5.1	5.2	5,917	33	W.	NW.	10	14	6	17	8	5	6	27	0	9	13	9	0	14	5	16	0	1	0	D.
4.9	4.4	3.3	4.2	56,257	...	....	NW.	68	144	85	196	63	111	143	260	24	158	129	77	0	138	14	57	30	45	0	Y.

MILWAUKEE, WIS.

[$H=697.$ $T=106.$ $h=135.$]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
8.0	7.6	6.5	7.4	9,285	39	N.	NW.	14	8	5	3	9	11	20	22	1	1	15	15	0	25	25	29	0	0	0	J.
6.5	5.9	4.2	5.5	9,045	39	W.	SW.	6	1	8	9	6	21	15	18	0	5	14	9	0	14	12	22	0	0	0	F.
6.3	6.3	5.1	5.9	9,412	37	N.	N.	21	15	6	7	2	13	11	18	0	8	11	12	0	17	7	26	0	4	0	M.
6.6	5.4	4.4	5.5	7,426	34	W.	N.	24	12	6	20	5	6	8	7	2	8	12	10	0	12	3	8	0	3	0	A.
4.1	5.2	1.8	3.7	7,008	33	N., SW.	N.	23	10	6	11	8	20	6	6	3	13	15	3	0	9	0	0	0	4	0	M.
2.8	5.1	2.3	3.4	5,645	32	NE.	NE., SE	16	13	16	16	4	12	4	6	3	13	15	2	0	8	0	0	0	4	0	J.
4.1	4.2	2.3	3.5	6,271	32	N.	E.	15	14	16	13	6	13	7	6	3	13	16	2	0	7	0	0	4	3	0	J.
5.8	4.7	3.8	4.8	6,609	29	W.	NE., SE	5	17	16	17	11	13	7	5	2	10	15	6	0	8	0	0	1	5	0	A.
6.6	6.7	3.6	5.6	7,556	39	SW.	S.	5	5	5	12	18	17	14	14	0	5	17	8	0	12	0	0	0	6	0	S.
5.2	5.4	2.4	4.3	7,408	48	NW.	SW.	10	7	4	15	10	25	10	11	1	12	13	6	0	6	0	2	0	1	0	O.
6.5	6.5	4.5	5.8	9,529	44	W.	W.	6	2	8	4	9	15	32	14	0	7	14	9	0	14	8	21	0	0	0	N.
5.4	6.7	5.0	5.7	8,108	39	W.	W.	8	2	2	2	8	17	31	23	0	6	15	10	0	13	23	28	0	0	0	D.
5.7	5.8	3.8	5.1	93,302	...	....	SW.	153	106	98	129	96	183	165	150	15	101	172	92	0	145	78	136	5	30	0	Y.

MOBILE, ALA.

[$H=35.$ $T=87.$ $h=81.$]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
6.8	5.5	4.9	5.7	6,820	32	NW., SE.	NW.	22	8	6	12	10	3	4	27	1	6	13	12	0	13	3	8	0	1	0	J.
5.3	4.2	2.7	4.1	6,037	28	N.	N.	25	7	5	13	13	5	2	13	1	11	12	5	0	6	0	5	0	1	0	F.
6.3	5.3	4.3	5.3	6,500	27	S.	N.	23	5	1	16	19	5	9	15	0	10	10	11	1	20	0	0	0	4	0	M.
4.8	4.7	2.5	4.0	6,067	36	SE.	SE.	13	6	7	27	17	3	2	15	0	13	12	5	0	10	0	0	0	3	0	A.
4.1	3.1	1.9	3.0	6,115	28	SE.	S.	17	3	1	11	29	13	7	12	0	16	12	3	0	5	0	0	0	1	0	M.
5.8	5.9	3.0	4.9	4,896	22	SE., S.	SE., NW.	12	14	6	17	14	9	1	17	0	7	17	6	0	20	0	0	2	12	0	J.
6.0	5.4	1.6	4.3	4,299	24	S., W.	S.	12	4	4	12	19	17	13	8	4	8	21	2	0	16	0	0	4	8	0	J.
5.5	4.6	1.4	3.8	4,670	28	NW.	NW.	13	12	6	16	8	6	11	19	2	8	21	2	0	12	0	0	11	6	0	A.
5.2	4.5	1.1	3.6	4,983	21	E.	N.	21	16	6	16	15	2	2	11	1	12	18	0	0	7	0	0	3	4	0	S.
3.3	2.1	1.4	2.3	5,639	24	N.	N.	32	9	7	14	6	1	3	20	1	21	9	1	0	2	0	0	0	0	0	O.
5.5	4.5	2.7	4.2	6,034	32	W.	N.	22	4	2	15	11	11	6	19	0	12	12	6	0	8	0	1	0	1	0	N.
5.4	5.8	4.7	5.3	5,471	28	NW.	NW.	18	15	5	11	9	5	5	25	0	9	12	10	0	6	0	7	0	1	0	D.
5.3	4.6	2.7	4.2	67,531	...	....	N.	230	103	56	180	170	80	65	201	10	133	169	63	1	125	3	21	20	42	0	Y.

Monthly and yearly meteorological summaries—Continued.

MONTGOMERY, ALA.

[Latitude, 32° 23′ N.; longitude, 86° 18′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J ..	29.857	30.41	29.29	37.4	46.1	41.8	41.8	66	5	49.5	33.8	33	35	35	34	83	68	77	76	6.69	2.07
F ..	29.918	30.47	29.52	40.5	54.3	46.7	47.2	73	14	57.9	36.6	33	34	37	35	76	50	69	65	4.10	2.11
M ..	29.802	30.11	29.35	49.7	61.9	55.6	55.7	77	30	64.8	47.2	44	44	46	43	81	57	72	70	6.86	2.72
A ..	29.823	30.07	29.41	56.7	71.7	63.0	63.8	84	36	74.7	54.9	50	49	53	51	81	49	71	67	7.38	3.66
M ..	29.779	30.00	29.57	65.4	81.4	71.3	72.7	93	50	84.5	63.1	60	58	62	60	84	47	73	68	2.95	1.40
J ..	29.732	29.92	29.55	73.6	83.7	75.1	77.5	95	64	87.8	70.5	69	70	70	70	87	65	86	79	8.61	1.72
J ..	29.731	29.94	29.55	74.2	86.4	78.1	79.6	95	65	90.1	72.1	70	70	72	71	88	59	82	76	3.37	1.13
A ..	29.755	30.00	29.51	74.5	87.4	78.2	80.0	98	66	89.9	72.8	70	70	72	71	87	58	81	75	5.37	2.19
S ..	29.855	30.03	29.69	70.4	85.6	76.0	77.3	97	54	87.2	69.8	66	65	67	66	85	51	74	70	1.12	.65
O ..	29.931	30.11	29.69	56.6	76.1	65.2	66.0	88	37	77.6	56.3	51	52	54	52	81	45	69	65	0.03	.03
N ..	29.926	30.23	29.47	46.9	62.3	52.8	54.0	79	31	64.4	44.4	43	46	47	45	86	58	81	75	6.72	2.02
D ..	29.929	30.14	29.53	39.4	50.9	44.2	44.8	67	22	53.8	36.7	37	39	39	38	90	65	83	80	3.05	1.03
Y ..	29.836	30.47	29.29	57.1	70.6	62.3	63.3	98	5	73.5	54.8	52	53	54	53	84	56	77	72	56.25	....

MONTROSE, COLO.

[Latitude, 38° 30′ N.; longitude, 107° 56′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	24.268	24.56	23.74	16.2	31.4	22.6	23.4	48	−11	34.8	14.4	10	20	16	16	77	65	76	72	0.79	0.32
F ..	24.355	24.72	23.87	23.7	42.8	30.6	32.4	58	11	47.0	22.4	18	24	24	22	77	50	75	67	0.13	0.08
M ..	24.223	24.54	23.82	23.8	42.8	32.7	33.1	66	7	48.0	22.3	18	22	23	21	78	47	70	65	0.49	0.13
A ..	24.190	24.48	23.91	35.1	52.9	42.3	43.4	71	18	57.2	33.0	26	27	30	28	71	40	63	58	3.14	1.93
M ..	24.332	24.52	24.12	48.0	72.4	58.9	59.8	90	35	76.2	45.7	30	27	33	30	52	21	40	38	0.57	0.39
J ..	24.305	24.44	24.01	53.8	80.3	66.4	66.8	90	42	83.7	51.8	36	28	37	34	53	16	35	35	0.01	0.01
J ..	24.357	24.50	24.22	61.2	87.0	73.4	73.9	98	53	91.1	59.0	45	43	46	44	56	23	39	39	0.33	0.12
A ..	24.361	24.44	24.24	59.6	82.4	68.4	70.1	93	47	86.1	57.1	48	46	51	48	68	31	57	52	1.38	0.47
S ..	24.338	24.53	24.14	48.9	72.2	58.1	59.7	83	31	75.7	46.0	37	39	38	38	66	34	50	50	1.06	0.99
O ..	24.341	24.64	23.99	39.5	60.0	46.1	48.5	76	25	63.6	36.3	31	32	33	32	74	38	62	58	0.95	0.35
N ..	24.357	24.76	23.78	22.7	37.5	25.8	28.7	56	−18	42.1	15.6	14	22	17	18	71	55	71	66	0.54	0.38
D ..	24.377	24.68	24.03	26.1	41.5	28.8	32.1	53	11	44.4	20.6	19	24	22	22	74	51	75	67	0.50	0.23
Y ..	24.317	24.76	23.74	38.2	58.6	46.2	47.7	98	−18	62.5	35.4	28	30	31	29	68	39	59	56	9.89	....

MOORHEAD, MINN.

[Latitude, 46° 52′ N.; longitude, 96° 44′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	29.164	29.56	28.68	−10.2	−1.3	−9.1	−6.9	32	−36	3.0	−17.0	−12	−4	−10	−9	94	88	94	92	0.94	0.20
F ..	29.031	29.61	28.43	2.1	12.1	8.3	7.5	51	−37	20.0	−4.4	zero	7	6	4	92	81	90	87	0.78	0.24
M ..	28.999	29.51	28.49	18.0	29.9	23.7	23.9	59	−6	33.3	14.6	15	21	20	19	88	72	84	81	0.14	0.04
A ..	28.946	29.39	28.39	37.8	54.8	44.1	45.6	84	4	57.8	34.3	33	36	35	35	84	54	72	70	5.49	1.86
M ..	28.927	29.21	28.60	48.8	66.5	53.9	56.4	86	27	68.7	43.2	41	43	44	43	76	46	70	64	2.51	1.25
J ..	28.950	29.25	28.52	56.2	73.1	60.4	63.2	89	33	75.3	49.4	51	52	53	52	82	48	77	69	3.71	1.45
J ..	28.929	29.26	28.61	60.2	80.1	68.1	69.5	94	47	82.4	57.6	56	62	61	60	87	55	79	74	5.40	5.17
A ..	28.917	29.19	28.68	56.6	78.9	64.9	66.8	100	32	81.1	54.3	54	56	57	56	90	48	76	71	1.32	0.42
S ..	28.901	29.26	28.28	45.1	64.6	53.0	54.2	90	23	67.5	41.6	41	45	44	43	85	51	72	69	1.31	1.05
O ..	29.008	29.65	28.53	39.2	59.2	46.8	48.4	83	10	62.2	35.9	34	40	39	38	83	52	75	70	2.21	1.52
N ..	28.974	29.45	28.05	16.6	29.2	19.4	21.7	58	−22	33.4	10.9	11	18	13	14	79	64	75	73	2.42	1.68
D ..	29.144	29.78	28.54	−4.2	4.5	−1.1	−0.3	34	−35	9.1	−10.1	−9	−2	−7	−6	79	74	76	76	0.53	0.14
Y ..	28.991	29.78	28.05	30.5	46.0	36.0	37.5	100	−37	49.5	25.9	26	31	29	29	85	61	78	75	26.76	....

MOUNT WASHINGTON, N. H.

[Latitude, 44° 16′ N.; longitude, 71° 18′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	23.432	24.09	22.42	10.5	11.5	12.2	11.4	37	−37	20.3	3.1	11	11	10	10	94	92	90	92	4.85	1.85
F ..	23.344	24.22	22.32	5.1	6.6	5.1	5.6	41	−39	15.7	−3.9	4	6	4	5	89	92	92	91	9.03	6.28
M ..	23.351	24.00	22.59	10.3	12.7	11.0	11.3	44	−37	17.4	3.4	11	14	12	12	96	96	96	96	3.11	0.82
A ..	23.785	24.23	23.26	26.9	32.1	26.6	28.5	52	2	35.4	22.5	25	28	23	25	92	86	87	88	3.36	0.76
M ..	23.678	24.02	23.13	32.5	37.4	33.5	34.5	49	18	40.7	29.0	30	33	31	32	92	86	91	90	3.25	0.89
J ..	23.811	24.15	23.34	40.1	45.4	41.1	42.2	58	24	49.3	35.8	38	41	39	39	91	86	92	90	6.09	1.50
J ..	23.855	24.17	23.57	45.3	50.0	45.6	47.0	67	28	52.6	41.9	43	44	43	43	91	83	91	88	6.30	2.72
A ..	23.869	24.19	23.31	45.2	49.7	45.5	46.8	69	28	53.7	41.0	41	44	41	42	88	84	87	86	8.34	2.27
S ..	23.913	24.40	23.50	37.8	42.4	40.3	40.2	62	11	47.6	33.9	33	38	36	36	87	86	86	86	8.52	2.27
O ..	23.842	24.16	23.25	30.9	33.0	30.5	31.5	49	−1	37.9	24.6	26	29	27	28	86	88	87	87	5.09	1.67
N ..	23.484	23.94	22.86	18.2	20.0	19.8	19.3	45	−2	26.9	11.9	17	19	18	18	96	95	94	95	6.48	2.07
D ..	23.451	23.94	22.83	9.5	7.9	8.1	8.5	32	−25	17.3	−1.2	8	7	6	7	94	94	92	94	3.10	0.71
Y ..	23.651	24.40	22.32	26.0	29.1	26.6	27.2	69	−39	34.6	20.2	24	26	24	25	92	89	90	90	67.52	....

Monthly and yearly meteorological summaries—Continued.

MONTGOMERY, ALA.

[$H=219$. $T=34$. $h=58$.]

Cloudiness (in tenths).				Wind.												Number of days—											
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.5	6.8	5.8	6.4	5,447	30	W.	NW.	11	10	17	6	5	4	16	19	5	6	12	13	0	11	4	8	0	2	0	J.
4.8	4.6	4.6	4.7	4,432	22	NW., W., N.	W., SW., SE.	11	4	7	12	8	12	12	11	7	10	8	10	0	5	0	7	0	0	0	F.
6.2	6.8	4.8	5.9	4,667	25	SW.	SE., S.	11	7	7	14	14	13	13	10	4	7	13	11	0	10	0	1	0	5	0	M.
3.5	6.2	3.8	4.5	4,716	24	NW., W.	E.	4	4	21	17	13	7	13	9	2	15	7	8	0	9	0	0	0	3	0	A.
3.2	4.8	1.6	3.2	3,819	28	W.	SW.	8	3	4	8	18	21	10	15	6	15	13	3	0	6	0	0	8	7	0	M.
6.7	7.5	6.0	6.7	3,459	32	W.	SE.	6	8	9	21	17	9	10	8	2	4	11	15	0	16	0	0	9	15	0	J.
4.1	6.5	3.7	4.8	2,997	16	SW.	SW.	7	9	11	13	14	18	8	7	6	8	18	5	0	6	0	0	18	10	0	J.
5.7	6.6	3.5	5.3	3,172	20	W.	SE.	11	11	11	17	11	7	9	9	7	6	19	6	0	11	0	0	13	6	0	A.
4.5	5.3	3.0	4.3	3,893	20	E.	E.	8	13	33	9	8	7	4	4	4	11	15	4	0	4	0	0	6	2	0	S.
2.7	2.8	1.7	2.4	3,786	24	E.	E.	16	15	33	3	1	1	4	16	4	21	6	4	0	1	0	0	0	0	0	O.
4.4	5.4	4.7	4.8	3,662	25	SW.	S.	16	0	2	14	18	10	10	15	5	12	8	10	0	11	0	1	0	2	0	N.
4.5	5.5	4.4	4.8	3,698	25	NW.	NW.	12	6	8	17	7	5	13	20	5	10	13	8	0	9	0	9	0	0	0	D.
4.7	5.7	4.0	4.8	47,748	...	....	E.	121	90	163	151	134	114	122	143	57	125	143	97	0	99	4	26	54	52	0	Y.

MONTROSE, COLO.

[$H=5,780$. $T=17$. $h=1$.]

6.3	5.4	5.2	5.6	4,060	40	SW.	SE.	6	6	6	32	10	16	6	8	3	10	7	14	0	12	12	27	0	0	0	J.
4.1	3.9	2.5	3.5	3,823	44	SW.	SE.	4	3	6	35	7	7	5	15	2	12	13	3	0	4	0	28	0	0	0	F.
4.6	5.5	4.9	5.0	5,452	36	SW.	SE.	4	5	13	28	16	13	5	9	0	6	19	6	0	12	0	29	0	0	0	M.
6.0	6.3	5.2	5.8	5,427	30	SW.	SW.	4	7	16	18	11	21	9	3	1	9	10	11	0	13	0	10	0	2	0	A.
2.1	4.2	1.9	2.8	6,319	34	SW.	SE.	1	10	4	33	17	13	8	6	1	17	14	0	0	3	0	0	0	4	0	M.
1.4	3.1	1.3	1.9	5,981	30	W.	SE.	1	2	4	33	13	14	13	7	3	19	11	0	0	1	0	0	0	6	0	J.
2.3	4.0	3.9	3.4	5,828	44	SE.	SE.	5	3	8	24	20	9	10	10	4	14	16	1	0	5	0	0	19	12	0	J.
3.7	5.0	4.1	4.3	4,281	26	S.	SE.	1	2	5	35	14	7	12	13	4	10	18	3	0	9	0	0	8	10	0	A.
2.0	3.5	1.3	2.3	4,394	32	E.	SE.	6	2	7	38	16	8	5	8	0	21	8	1	0	5	0	1	0	6	0	S.
2.9	4.3	3.5	3.6	4,468	34	S.	SE.	6	4	5	38	13	9	6	11	1	14	15	2	0	7	0	10	0	3	0	O.
3.5	4.4	2.9	3.6	3,304	32	W., SW.	SE.	10	7	12	39	3	5	5	7	2	17	7	6	0	7	5	28	0	1	0	N.
4.2	4.5	2.9	3.9	3,176	20	NW.	SE.	3	8	15	41	4	5	2	12	3	15	10	6	0	4	0	30	0	0	0	D.
3.6	4.5	3.3	3.8	56,513	...	....	SE.	51	59	101	394	144	127	86	109	24	164	148	53	0	82	17	163	27	44	0	Y.

MOORHEAD, MINN.

[$H=926$. $T=52$. $h=41$.]

5.0	6.3	3.2	4.8	8,217	38	S.	N.	40	5	1	4	11	5	3	20	4	8	15	8	0	10	30	31	0	0	1	J.
4.9	7.6	4.8	5.8	9,934	44	S.	N.	27	7	2	9	19	6	1	13	0	5	14	9	0	11	19	28	0	0	1	F.
6.4	7.3	4.7	6.1	9,454	38	N.	N.	28	6	4	12	16	9	2	15	1	5	15	11	0	6	12	30	0	0	2	M.
5.4	6.3	4.6	5.4	10,529	46	SE.	S.	25	5	3	15	26	2	4	8	2	7	15	8	0	14	2	9	0	3	3	A.
4.2	5.3	3.8	4.4	8,264	44	S.	N.	19	7	6	11	17	13	8	12	0	12	15	4	0	11	0	3	0	1	4	M.
4.0	5.2	3.4	4.2	6,119	36	SE.	N.	22	13	3	12	17	9	1	12	1	13	12	5	0	10	0	0	0	7	3	J.
3.9	4.5	2.1	3.5	6,474	36	NW.	N.	23	13	4	15	22	6	6	3	1	12	18	1	0	4	0	0	3	5	3	J.
2.4	4.0	3.0	3.1	6,229	36	SW.	S.	12	8	6	17	23	8	3	12	4	13	16	2	1	7	0	1	7	7	1	A.
4.9	5.7	3.8	4.8	7,499	50	S.	NW.	9	6	2	16	15	12	12	18	0	6	19	5	0	8	0	7	1	3	0	S.
5.8	5.2	4.7	5.2	8,953	44	S.	S.	18	9	2	14	33	8	2	7	0	8	11	12	0	8	0	11	0	4	3	O.
5.4	6.2	5.1	5.6	8,464	48	NW.	S.	16	11	1	4	20	11	9	18	0	7	12	11	0	7	11	28	0	2	2	N.
6.1	6.2	5.8	6.0	7,173	34	NW.	S.	19	6	0	7	20	12	9	19	1	4	17	10	0	11	29	31	0	0	1	D.
4.9	5.8	4.1	4.9	97,309	...	....	N.	258	96	34	136	239	101	60	157	14	100	179	86	1	107	103	179	11	32	24	Y.

MOUNT WASHINGTON, N. H.

[$H=6,279$. $T=6$. $h=2$.]

3.6	5.1	4.8	4.5	23,889	122	NW.	NW.	4	5	2	6	5	14	6	50	1	10	15	6	5	20	26	31	0	0	2	J.
3.4	3.9	3.9	3.7	29,276	138	NW.	NW.	3	3	0	4	3	8	9	54	0	10	16	2	7	11	22	28	0	0	0	F.
4.1	5.7	5.0	4.9	20,250	115	NW.	NW.	5	1	1	3	3	5	11	63	1	10	13	8	8	21	29	30	0	0	0	M.
3.6	6.0	3.2	4.3	18,645	110	SW.	NW.	4	4	9	4	3	3	14	45	4	10	15	5	3	11	10	21	0	1	2	A.
2.5	5.6	3.0	3.7	21,985	88	S.	NW.	4	2	4	5	9	14	26	29	0	13	17	1	7	13	3	18	0	3	2	M.
4.4	5.2	3.0	4.2	19,895	94	NW.	NW.	5	2	3	5	6	14	22	33	0	7	20	3	10	17	0	9	0	0	3	J.
3.3	5.9	2.2	3.8	23,615	84	SW.	W.	3	0	0	5	1	16	39	29	0	11	18	2	6	15	0	2	0	3	1	J.
3.0	5.8	2.9	3.9	20,750	88	NW.	NW.	3	0	0	3	9	12	28	38	0	9	20	2	7	14	0	2	0	2	1	A.
2.9	4.8	2.8	3.5	25,060	100	W.	W.	3	4	0	1	7	21	39	15	0	14	12	4	3	16	2	15	0	0	3	S.
3.0	4.4	3.8	3.7	21,470	89	W.	W.	7	3	6	4	4	12	35	22	0	13	14	4	2	17	7	24	0	0	3	O.
3.5	3.6	4.4	3.8	20,665	99	NW.	NW.	3	1	3	7	5	18	23	30	0	11	16	3	7	19	20	28	0	0	1	N.
4.3	3.5	4.2	4.0	23,410	100	NW.	NW.	3	2	0	3	6	12	26	41	0	9	19	3	2	20	29	31	0	0	1	D.
3.5	5.0	3.6	4.0	268,910	...	....	NW.	47	27	28	50	61	149	278	449	6	127	195	43	67	194	148	239	0	9	19	Y.

Monthly and yearly meteorological summaries—Continued.

NASHVILLE, TENN.

[Latitude, 36° 10′ N.; longitude, 86° 47′ W.]

Months and year.	Pressure.			Temperature.									Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J..	29.482	30.04	28.85	25.2	33.0	28.8	29.0	59	−9	37.4	21.4	21	26	24	24	85	77	82	81	5.18	1.41
F..	29.544	30.10	29.10	28.1	42.9	35.1	35.4	61	−7	45.5	25.0	24	27	27	26	83	56	73	71	3.82	1.60
M.	29.418	29.82	28.76	41.8	53.2	46.4	47.1	78	22	56.1	38.8	35	35	34	34	77	54	65	65	4.76	1.66
A..	29.447	29.72	29.10	51.3	66.3	57.6	58.4	85	31	68.3	49.3	45	43	46	45	79	49	68	65	2.36	0.82
M.	29.392	29.67	29.11	61.5	75.6	67.2	68.1	91	45	79.2	58.5	56	56	57	56	82	53	72	69	2.10	0.61
J..	29.386	29.56	29.22	67.6	78.4	70.8	72.3	91	56	81.5	64.8	64	63	66	64	88	62	85	78	7.69	2.31
J..	29.377	29.56	29.18	70.3	86.0	74.7	77.0	96	57	88.2	67.1	66	63	68	66	86	48	80	71	1.90	0.75
A..	29.409	29.64	29.18	70.0	83.1	73.6	75.6	98	59	86.5	67.7	66	67	67	67	89	60	81	77	5.50	1.26
S..	29.518	29.70	29.30	64.4	79.9	69.0	71.1	90	45	82.2	61.1	61	61	61	62	89	55	84	76	3.68	1.47
O..	29.613	29.85	29.16	49.2	70.8	56.6	58.9	84	33	72.1	47.3	45	47	49	47	86	45	78	69	0.51	0.47
N..	29.514	29.94	29.03	40.0	54.0	45.8	46.6	74	23	56.9	35.8	36	37	37	36	86	56	72	71	5.76	1.73
D..	29.567	29.85	29.12	30.6	39.5	34.1	34.7	62	11	43.2	26.2	26	28	27	27	83	64	74	74	1.48	0.39
Y..	29.472	30.10	28.76	50.0	63.6	55.0	56.2	98	−9	66.4	46.9	45	46	47	46	84	57	76	72	44.74	....

NANTUCKET, MASS.

[Latitude, 41° 17′ N.; longitude, 70° 6′ W.]

J..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
F..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
M.	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
A..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
M.	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
J..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
J..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
A..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
S..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
O..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......
N..	29.978	30.46	29.36	45.3	49.0	46.1	46.8	63	33	53.4	39.4	38	39	38	38	78	70	75	74	2.25	0.66
D..	30.061	30.55	29.38	35.6	37.5	35.7	36.3	56	17	42.2	28.9	32	31	31	31	85	79	82	82	4.93	0.91
Y..	......	......	......	......	......	......	......	...	...	......	......	...	...	...	...	...	...	...	...	......	......

NEW HAVEN, CONN.

[Latitude, 41° 18′ N.; longitude, 72° 56′ W.]

J..	29.908	30.71	28.75	22.2	29.7	24.2	25.4	52	−7	33.2	17.1	18	22	19	19	83	72	80	78	3.53	1.24
F..	29.913	30.47	29.12	22.7	30.2	25.4	26.1	51	−8	35.2	18.2	18	20	18	19	82	66	75	74	5.95	2.99
M.	29.791	30.41	29.19	30.7	39.5	33.0	34.4	59	1	42.0	27.2	24	26	26	26	77	62	76	72	3.20	0.96
A..	30.007	30.50	29.38	44.0	55.2	45.6	48.3	81	26	58.5	39.7	38	37	40	38	81	55	82	72	3.21	1.79
M.	29.801	30.23	29.45	53.1	62.8	53.9	56.6	83	32	66.2	47.2	45	45	46	46	75	57	77	70	2.74	1.00
J..	29.865	30.19	29.38	59.9	69.1	60.3	63.1	80	46	72.0	54.4	53	54	55	54	79	61	83	74	2.84	1.36
J..	29.830	30.13	29.61	65.9	76.9	67.5	70.1	90	51	79.3	61.6	60	61	62	61	83	61	84	76	4.69	1.33
A.	29.861	30.25	29.44	64.1	75.1	65.5	68.2	86	48	78.1	59.5	59	60	60	60	85	62	84	77	4.56	2.57
S..	30.014	30.34	29.58	58.8	69.6	61.2	63.2	80	40	72.6	55.0	54	56	57	56	85	64	87	79	2.35	0.93
O..	30.047	30.44	29.65	48.0	59.6	50.9	52.8	78	25	63.2	43.6	43	44	45	44	84	58	82	75	1.95	0.70
N..	29.872	30.32	29.32	39.0	48.1	40.9	42.7	70	24	52.1	33.8	32	33	34	33	76	59	77	71	3.83	0.89
D..	29.991	30.49	29.28	24.4	31.2	26.3	27.3	56	7	35.6	20.0	20	20	21	20	83	65	79	76	3.47	1.19
Y..	29.908	30.71	28.75	44.4	53.9	46.2	48.2	90	−8	57.3	39.8	39	40	40	40	81	62	80	74	42.32	....

NEW LONDON, CONN.

[Latitude, 41° 21′ N.; longitude, 72° 5′ W.]

J..	29.993	30.79	28.76	24.5	32.2	26.7	27.8	50	−3	34.2	20.3	20	25	20	22	83	74	76	78	7.39	2.23
F..	29.989	30.58	29.10	24.5	31.9	27.0	27.8	52	−4	35.6	20.1	20	23	20	21	84	71	76	77	11.98	6.66
M.	29.870	30.51	29.25	31.6	39.9	33.9	35.1	56	4	41.9	28.2	26	29	28	28	79	67	78	75	4.64	1.78
A..	30.093	30.59	29.49	46.2	52.5	45.5	48.1	77	31	56.7	41.3	40	41	40	40	79	67	81	76	3.63	2.38
M	29.882	30.33	29.50	55.2	61.7	53.6	56.8	83	38	65.1	48.5	47	47	47	47	74	62	79	71	3.45	1.20
J..	29.951	30.26	29.47	61.8	67.2	60.2	63.1	78	47	70.0	55.8	55	56	56	56	79	68	87	78	2.14	0.68
J.	29.916	30.20	29.67	68.5	74.9	67.3	70.2	88	54	77.3	63.0	62	64	63	63	80	69	85	78	3.82	1.03
A..	29.940	30.33	29.51	65.2	73.2	65.4	67.9	84	50	75.6	60.7	60	62	60	61	85	70	85	80	5.04	1.39
S.	30.073	30.42	29.63	62.1	69.1	62.7	64.6	79	43	71.4	57.3	57	58	58	58	84	69	87	80	3.69	1.72
O..	30.131	30.53	29.73	49.6	59.5	51.2	53.4	76	30	62.4	45.1	45	47	46	46	85	64	83	78	4.14	2.00
N.	29.933	30.40	29.40	41.2	49.6	42.5	44.4	66	26	52.9	35.8	35	37	36	36	80	64	79	74	4.57	1.50
D..	30.000	30.50	29.32	26.7	33.4	29.6	29.9	54	10	37.3	22.4	23	26	26	25	85	74	84	80	4.37	1.40
Y..	29.981	30.79	28.76	46.4	53.8	47.1	49.1	88	−4	56.7	41.5	41	43	42	42	81	68	82	77	58.86	....

Monthly and yearly meteorological summaries—Continued.

NASHVILLE, TENN.

[$H=549.$ $T=92.$ $h=79.$]

Cloudiness (in tenths).				Wind.													Number of days—										Months and year.
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
6.7	7.8	7.7	7.4	5,329	30	NW.	W.	9	5	23	10	4	4	24	14	0	4	7	20	0	14	8	25	0	1	0	J.
4.8	4.3	4.6	4.6	4,545	35	NW.	NW.	4	6	17	10	8	6	15	18	0	11	9	8	0	10	4	20	0	1	0	F.
6.9	6.8	6.1	6.6	6,221	36	W.	S.	4	15	8	6	18	10	16	16	0	4	16	11	0	10	0	6	0	5	0	M.
5.3	6.3	4.8	5.5	5,273	38	W.	SE.	8	9	14	21	9	8	9	12	0	7	12	11	0	12	0	1	0	2	0	A.
4.8	5.8	4.0	4.9	4,773	32	W.	NW.	4	7	8	7	17	10	12	28	0	7	21	3	0	10	0	0	1	12	0	M.
5.5	7.2	5.4	6.0	3,827	29	NW.	NW.	9	13	10	14	7	9	9	19	0	5	14	11	0	16	0	0	1	10	0	J.
2.2	4.2	2.4	2.9	3,353	75	NW.	NW.	10	9	8	11	10	11	11	21	2	15	15	1	0	7	0	0	8	12	1	J.
4.9	6.3	3.5	4.9	3,643	37	NW.	NE.	3	16	15	14	5	10	15	14	1	6	20	5	0	15	0	0	7	12	0	A.
3.5	5.3	2.6	3.8	3,374	20	S.	E.	7	11	26	12	9	15	4	6	0	14	12	4	0	5	0	0	1	1	0	S.
2.6	3.4	2.1	2.7	3,384	28	S.	E.	10	9	22	3	7	4	13	20	5	21	7	3	0	3	0	0	0	1	0	O.
4.7	5.8	4.9	5.1	4,788	39	W.	W.	2	7	4	20	11	14	21	8	3	11	9	10	0	12	0	11	0	1	0	N.
6.5	7.4	5.8	6.6	5,143	27	W.,SW.	NW.	10	6	10	14	13	5	9	24	2	4	14	13	0	12	6	23	0	0	0	D.
4.9	5.9	4.5	5.1	53,153	..	....	NW.	80	113	165	142	118	106	158	200	13	109	156	100	0	126	18	86	18	58	1	Y.

NANTUCKET, MASS.

[$H=14.$ $T=8.$ $h=38.$]

...	...	...	...	......	..	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	J.
...	...	...	...	......	..	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	F.
...	...	...	...	......	..	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	M.
...	...	...	...	......	..	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	A.
...	...	...	...	......	..	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	M.
...	...	...	...	......	..	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	J.
...	...	...	...	......	..	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	J.
...	...	...	...	......	..	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	A.
...	...	...	...	......	..	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	S.
...	...	...	...	......	..	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	O.
5.0	5.9	3.7	4.9	8,290	31	NW.	NW.	6	8	0	8	4	21	8	35	0	10	11	9	0	11	0	0	0	1	0	N.
7.1	7.1	6.0	6.7	9,779	50	NE.	NE.,NW	7	25	7	0	5	15	9	25	0	4	13	14	0	19	5	20	0	0	0	D.
...	...	...	...	......	..	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	Y.

NEW HAVEN, CONN.

[$H=107.$ $T=112.$ $h=109.$]

6.5	6.4	5.5	6.1	7,809	44	NE.	NE.	19	23	5	3	4	2	19	17	1	7	13	11	0	15	10	25	0	0	0	J.
4.8	5.2	3.5	4.5	7,175	34	NW.	SW.	10	11	1	3	11	19	11	16	2	9	13	6	0	11	11	23	0	0	0	F.
6.4	5.4	5.0	5.6	7,247	32	NW.	NW.	17	16	5	5	9	5	11	18	7	8	12	11	0	13	3	22	0	2	0	M.
6.6	5.6	4.8	5.7	4,988	39	NE.	NE.	8	26	3	13	16	8	4	6	6	5	14	11	0	12	0	4	0	2	0	A.
6.2	5.9	5.0	5.7	5,763	30	NE.	NE.	9	18	4	7	14	15	13	7	6	9	10	12	0	13	0	0	0	2	1	M.
5.2	6.4	3.9	5.2	4,163	18	NW.	S.	7	13	4	6	22	9	8	11	10	9	15	6	0	10	0	0	0	1	3	J.
5.5	5.9	3.8	5.1	3,859	19	E.	S.	10	8	3	6	26	20	3	10	7	8	15	8	0	11	0	0	1	6	1	J.
5.0	4.5	3.4	4.9	4,167	24	N.	S.	9	10	3	10	17	11	11	11	11	10	15	6	0	11	0	0	0	0	1	A.
5.7	6.1	5.1	5.6	4,548	18	N., SW.	S.	12	10	5	6	15	13	7	11	11	5	16	9	0	12	0	0	0	0	0	S.
4.8	5.5	4.0	4.8	5,708	26	NE.	NE.	13	27	2	3	13	12	5	13	5	13	9	9	0	9	0	1	0	0	0	O.
5.5	5.1	4.4	5.0	5,614	32	W.	W.	7	7	1	4	10	15	29	16	1	8	14	8	0	10	0	14	0	1	0	N.
5.8	5.9	5.1	5.6	7,318	32	NE.	W.,NW	16	17	1	2	2	16	18	18	3	7	13	11	0	14	12	28	0	1	0	D.
5.7	5.7	4.5	5.3	68,359	..	....	NE.	137	186	37	68	159	145	139	154	70	98	159	108	0	141	36	117	1	15	6	Y.

NEW LONDON, CONN.

[$H=47.$ $T=29.$ $h=58.$]

6.4	6.2	4.5	5.7	5,655	40	NE.	N.	22	20	6	4	2	4	12	17	6	5	17	9	0	17	9	24	0	0	0	J.
5.9	6.4	2.6	5.0	6,084	43	NW.	W.	15	5	3	2	5	12	16	15	11	7	16	5	0	13	11	23	0	0	0	F.
6.0	6.3	6.0	6.1	5,165	32	S.	NW.	10	6	5	6	9	10	5	23	19	3	15	13	1	15	2	20	0	2	0	M.
6.6	5.7	2.4	4.9	4,768	30	SW.	SE.	6	16	4	21	9	10	7	4	13	6	20	4	0	11	0	2	0	1	0	A.
6.1	6.7	5.1	6.0	5,359	31	E.	SW.	3	12	4	15	5	24	9	14	7	7	11	13	0	11	0	0	0	1	0	M.
6.3	6.6	5.0	6.0	4,004	22	SE.	SW.	3	12	5	17	14	18	6	11	4	4	16	10	1	10	0	0	0	1	2	J.
6.5	6.3	5.1	6.0	4,014	23	W., S.	SW.	6	4	4	8	14	34	8	8	7	5	15	11	0	10	0	0	0	6	2	J.
5.1	6.8	2.5	4.8	4,149	27	SW.	NW.	10	9	3	10	15	14	3	16	13	8	19	4	0	11	0	0	0	1	2	A.
5.8	6.3	5.5	5.9	4,647	24	S.	N.	16	12	2	13	10	14	9	8	6	5	18	7	0	8	0	0	0	1	0	S.
5.2	6.0	4.2	5.1	4,808	22	S., NW.	NE.	8	30	8	4	4	14	5	14	6	9	14	8	0	10	0	1	0	0	0	O.
6.0	4.9	4.4	5.1	5,625	48	SW.	NW.	13	7	0	2	8	11	17	25	7	9	13	8	0	11	6	10	0	1	0	N.
5.5	6.2	4.8	5.5	5,475	24	N., NW.	N.	27	11	1	1	5	4	23	12	9	10	9	12	0	14	9	26	0	0	0	D.
6.0	6.2	4.3	5.5	59,753	..	....	SW.	139	144	45	103	100	169	120	167	108	78	183	104	2	141	31	106	0	14	6	Y.

Monthly and yearly meteorological summaries—Continued.

NEW ORLEANS, LA.

[Latitude 29° 58′ N.; longitude, 90° 4′ W.]

Month and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitations.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°						
J...	30.042	30.55	29.65	42.8	48.4	45.2	45.5	72	15	53.0	38.7	39	39	39	39	87	72	80	80	7.53	4.28
F...	30.091	30.58	29.69	47.9	59.3	52.4	53.2	74	25	62.4	44.9	42	40	43	42	82	50	73	68	1.96	.75
M...	29.982	30.27	29.63	54.8	63.4	57.5	58.6	81	40	66.1	52.3	50	48	51	50	87	63	80	76	8.41	2.63
A...	29.977	30.20	29.58	60.7	72.1	63.9	65.6	86	41	74.6	58.3	57	54	59	56	88	56	84	76	5.60	2.72
M...	29.963	30.15	29.81	67.8	79.9	70.2	72.6	91	57	82.1	65.7	64	59	65	63	86	51	84	74	3.07	1.38
J...	29.879	30.06	29.72	76.4	83.3	76.4	78.7	92	70	87.3	73.2	73	71	72	72	90	68	88	82	9.30	1.38
J...	29.907	30.10	29.68	77.2	83.6	78.5	79.8	93	71	88.1	74.5	74	70	73	72	89	67	84	80	4.35	1.83
A...	29.922	30.12	29.74	77.5	87.2	79.4	81.4	95	68	89.9	75.6	74	71	74	73	88	60	84	77	2.40	.79
S...	29.987	30.08	29.88	74.3	82.8	76.4	77.8	92	62	85.3	72.7	71	70	72	71	90	66	87	81	4.09	1.65
O...	30.081	30.28	29.77	64.5	75.9	68.1	69.5	87	45	77.9	63.4	59	58	60	59	82	55	78	72	0.22	.13
N...	30.113	30.47	29.68	55.0	65.0	57.2	59.1	82	34	68.5	50.9	50	50	51	50	82	61	80	74	5.33	1.73
D...	30.109	30.35	29.75	47.6	57.4	49.8	51.6	72	27	60.1	43.8	43	43	43	43	83	62	78	74	2.57	.79
Y...	30.004	30.58	29.58	62.2	71.5	64.6	66.1	95	15	74.6	59.5	58	56	58	58	86	61	82	76	54.83	....

NEW YORK CITY.

[Latitude, 40° 43′ N.; Longitude 74° 0′ W.]

J...	29.865	30.67	28.63	26.3	32.1	27.1	28.5	54	3	35.7	22.2	20	26	21	22	78	78	78	78	5.02	1.51
F...	29.877	30.35	29.04	25.4	32.5	27.7	28.5	56	−2	37.1	21.3	19	22	21	21	77	68	77	74	5.90	3.25
M...	29.750	30.31	29.13	33.3	42.1	35.2	36.9	60	7	45.2	30.2	26	30	28	28	76	65	77	73	3.54	1.21
A...	29.942	30.40	29.27	45.9	56.8	48.1	50.3	84	29	60.2	42.6	40	41	41	41	81	60	78	73	4.95	3.72
M...	29.752	30.16	29.42	54.9	63.9	56.8	58.5	86	42	67.0	51.3	47	48	49	48	76	59	78	71	6.53	2.68
J...	29.818	30.13	29.34	62.5	70.7	63.5	65.6	83	53	73.8	58.7	56	60	57	58	81	71	82	78	3.01	1.07
J...	29.785	30.08	29.57	68.7	78.9	71.0	72.9	90	60	81.5	65.6	61	61	63	62	79	56	76	70	2.57	0.55
A...	29.818	30.17	29.44	67.5	76.2	69.3	71.0	88	58	79.3	64.9	60	60	62	61	79	58	77	72	1.18	0.85
S...	29.965	30.27	29.55	63.4	72.3	65.6	67.1	86	50	74.9	61.1	56	59	59	58	79	64	80	74	1.79	1.14
O...	30.000	30.35	29.62	52.8	62.1	54.7	55.6	82	35	65.4	49.9	46	45	46	46	78	56	75	70	3.90	2.75
N...	29.837	30.26	29.31	42.1	50.0	43.8	45.3	73	29	54.8	38.8	34	35	36	35	75	58	74	69	4.61	1.56
D...	29.949	30.41	29.27	27.8	33.9	30.8	30.8	54	14	37.8	25.5	22	24	25	23	79	68	79	75	3.73	1.11
Y...	29.863	30.67	28.63	47.6	56.0	49.5	51.0	90	−2	59.4	44.3	41	42	42	42	78	64	76	73	46.73	....

NORFOLK, VA.

Latitude, 36° 51′ N.; Longitude, 76° 17′ W.]

J...	30.015	30.71	29.02	31.4	37.5	34.0	34.3	63	9	42.1	28.6	27	29	29	28	84	73	82	80	2.93	0.71
F...	30.092	30.58	29.38	32.3	44.5	36.4	37.7	71	3	48.5	29.1	26	32	28	29	77	63	72	71	4.03	1.77
M...	29.965	30.38	29.34	41.5	52.7	44.8	46.3	77	21	56.2	38.3	34	38	35	36	74	60	71	68	2.32	0.76
A...	30.065	30.40	29.42	52.0	62.8	53.6	56.1	87	38	66.3	48.3	47	47	46	47	83	60	77	73	3.16	2.01
M...	29.917	30.31	29.47	61.0	72.0	62.0	65.0	87	45	73.2	54.1	55	57	56	56	82	62	81	75	8.32	2.80
J...	29.962	30.24	29.60	68.9	76.6	68.3	71.3	93	56	79.4	64.8	64	63	64	64	84	64	87	78	5.34	0.73
J...	29.928	30.16	29.72	72.9	82.7	72.6	76.1	92	64	84.8	69.2	70	69	69	69	90	64	89	81	4.23	1.63
A...	29.963	30.29	29.68	72.0	79.7	71.7	74.5	93	64	82.7	69.2	68	67	68	68	89	67	88	82	10.23	3.19
S...	30.106	30.34	29.76	68.9	76.6	69.3	71.6	89	60	79.1	66.1	64	62	64	64	86	63	86	78	4.63	2.19
O...	30.147	30.46	29.85	57.0	68.5	58.5	61.3	81	44	70.6	54.3	52	51	52	52	85	56	81	74	1.31	1.27
N...	30.057	30.41	29.48	46.6	58.5	48.5	51.2	75	30	61.1	42.6	40	39	41	40	78	50	76	68	1.94	0.56
D...	30.112	30.48	29.48	34.1	42.5	36.3	37.6	66	20	46.2	31.8	30	32	32	31	85	72	85	81	5.85	1.40
Y...	30.028	30.71	29.02	53.2	62.9	54.7	56.9	93	3	65.8	49.7	48	49	49	48	83	63	81	76	54.33	....

NORTH PLATTE, NEBR.

[Latitude, 41° 8′ N.; Longitude, 100° 45′ W.]

J...	27.101	27.44	26.73	10.0	23.3	14.6	16.0	52	-21	26.1	6.4	5	16	9	10	81	76	80	79	0.09	0.03
F...	27.069	27.40	26.56	26.1	40.1	32.2	32.8	61	5	45.4	23.8	22	30	26	26	84	68	79	77	0.17	0.08
M...	27.021	27.33	26.53	23.5	37.6	30.5	30.5	73	—8	42.3	20.8	19	27	24	24	83	68	79	76	0.63	0.21
A...	27.001	27.43	26.54	39.7	54.6	47.3	47.2	82	16	59.5	37.9	35	41	41	39	84	64	79	76	2.09	0.59
M...	27.059	27.32	26.72	53.0	73.1	63.0	63.0	92	36	77.1	52.1	47	48	52	49	81	46	68	65	3.67	1.03
J...	27.084	27.44	26.72	58.8	75.5	68.4	67.6	90	50	79.0	57.7	54	55	57	56	86	52	68	69	1.14	0.36
J...	27.086	27.29	26.91	65.7	86.5	77.2	76.5	102	56	89.4	64.6	59	62	65	62	81	46	66	64	0.68	0.34
A...	27.078	27.27	26.87	64.2	84.1	73.1	73.8	99	45	86.8	63.0	60	61	63	61	87	48	71	69	1.99	1.30
S...	27.073	27.39	26.67	51.8	71.7	61.2	61.6	91	34	74.6	50.4	47	49	49	48	85	48	66	66	1.22	0.94
O...	27.124	27.62	36.74	44.5	64.4	53.6	54.2	77	26	66.7	43.4	40	44	42	42	85	50	68	68	0.59	0.42
N...	27.093	27.50	26.44	24.7	40.7	30.2	31.9	68	—5	42.6	22.2	21	30	24	25	84	66	80	77	0.43	0.26
D...	27.126	27.65	26.71	17.2	29.9	22.4	23.2	57	—7	33.7	15.1	13	23	17	18	83	74	80	79	0.40	0.12
Y...	27.076	27.65	26.44	39.9	66.8	47.8	48.2	102	-21	60.3	38.1	35	40	39	38	84	59	74	72	13.10	....

Monthly and yearly meteorological summaries—Continued.

NEW ORLEANS, LA.

[H = 52. T = 87. h = 77.2.]

Cloudiness (in tenths).				Wind.													Number of days.										Months and year.
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
5.5	6.6	3.7	5.3	6,205	31	E.	NW.	16	12	14	12	3	6	6	23	1	7	17	7	3	9	3	6	0	2	0	J.
5.5	4.8	3.1	4.5	5,777	26	SE.	SE.	14	8	12	18	11	8	6	6	1	10	11	7	0	4	0	2	0	1	0	F.
5.9	6.5	5.1	5.8	6,118	23	NE., SE.	SE.	13	9	18	24	6	9	2	11	1	7	12	12	0	13	0	0	0	4	0	M.
4.0	5.5	4.0	4.5	6,045	29	NE.	SE.	8	8	16	29	8	4	8	9	0	10	14	6	0	7	0	0	0	5	0	A.
3.5	4.5	1.7	3.2	4,577	23	N.	SE.	3	12	9	18	15	11	13	6	6	15	13	3	0	6	0	0	1	3	0	M.
4.7	6.5	4.1	5.1	3,839	24	SE.	SE.	9	5	13	26	10	10	7	3	7	7	16	7	0	21	0	0	5	15	0	J.
4.5	6.9	2.6	4.7	3,762	24	SE.	SW.	6	5	5	17	16	28	11	2	3	9	16	6	0	17	0	0	9	5	0	J.
4.3	6.0	1.7	4.0	4,399	23	NW.	SW.	7	11	13	17	7	19	6	11	2	11	19	1	0	13	0	0	15	5	0	A.
5.1	6.2	2.6	4.6	5,524	27	NE.	NE.	7	29	23	8	11	6	3	1	2	9	16	5	0	13	0	0	1	2	0	S.
2.4	3.2	1.1	2.2	6,025	38	NE.	NE.	24	32	12	14	6	0	0	3	2	21	10	0	0	2	0	0	0	0	0	O.
5.1	4.7	3.3	4.4	5,906	26	NW.	N.	15	14	13	10	13	10	5	8	2	12	11	7	0	9	0	0	0	2	0	N.
5.6	5.2	2.6	4.5	5,919	25	NW.	E.	15	12	24	16	2	6	2	16	0	12	12	7	0	10	0	4	0	1	0	D.
4.7	5.6	3.0	4.4	64,096	..	....	SE.	137	157	172	209	108	117	69	99	27	130	167	68	3	124	3	12	31	45	0	Y.

NEW YORK CITY.

[H = 168. T = 148. h = 145.]

Cloudiness (in tenths).				Wind.													Number of days.										Months and year.
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
4.9	6.5	5.0	5.5	9,317	44	NE.	NW.	14	20	7	3	2	2	12	33	0	9	12	10	0	12	10	22	0	0	0	J.
3.9	4.7	2.9	3.8	11,125	64	NW.	NW.	7	8	3	7	8	15	15	21	0	13	12	3	0	9	11	22	0	0	0	F.
5.9	5.2	4.0	5.0	10,767	54	NW.	NW.	7	13	8	3	9	10	10	32	1	10	13	8	0	11	2	15	0	0	0	M.
5.9	4.4	3.6	4.6	6,220	40	NE.	NE.	8	24	8	14	10	9	9	7	1	9	15	6	0	9	0	2	0	1	0	A.
5.3	6.5	5.0	5.6	6,384	34	NE.	SW., NW	7	15	4	13	12	17	6	17	2	8	14	9	0	13	0	0	0	2	0	M.
5.1	4.7	4.5	4.8	5,219	26	NE.	S.	8	13	3	12	25	8	5	15	1	10	12	8	0	9	0	0	0	1	0	J.
4.3	4.4	2.9	3.9	4,429	29	E.	S.	16	5	4	11	23	14	8	10	2	15	10	6	0	10	0	0	1	6	0	J.
3.8	4.2	2.5	3.5	5,064	24	NW., NE	S.	8	12	8	4	21	8	11	19	2	14	14	3	0	6	0	0	0	0	1	A.
5.8	5.2	5.0	5.3	4,633	27	SW.	S.	8	14	8	9	18	8	6	16	3	6	17	7	0	7	0	0	0	1	0	S.
4.3	4.8	3.8	4.3	6,048	28	NW.	N., NE.	18	18	5	6	7	10	13	14	2	15	8	8	0	7	0	0	0	0	0	O.
5.0	4.7	4.3	4.7	7,046	40	SW.	NW.	6	4	3	7	10	14	22	23	1	12	10	8	0	9	0	7	0	2	0	N.
5.1	5.3	5.0	5.1	7,461	34	NW.	NE.	14	22	1	3	5	9	19	19	1	10	11	10	0	13	10	25	0	0	0	D.
4.9	5.0	4.0	4.6	83,713	..	....	NW.	121	168	62	92	150	124	136	226	16	131	148	86	0	115	33	93	1	13	1	Y.

NORFOLK, VA.

[H = 30. T = 61. h = 52.]

Cloudiness (in tenths).				Wind.													Number of days.										Months and year.
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
5.1	6.3	3.5	5.0	5,176	38	W.	N.	25	11	7	5	3	7	11	13	11	10	14	7	1	15	6	21	0	0	0	J.
3.2	3.8	1.9	3.0	5,043	28	S., NW.	N.	21	11	1	5	16	8	7	10	5	15	11	2	0	10	2	15	0	0	0	F.
4.2	4.9	2.7	3.9	6,125	35	S.	N.	20	14	6	4	12	16	5	11	5	12	13	6	0	8	0	8	0	0	0	M.
4.7	5.1	4.9	4.9	4,456	24	SW.	NE.	6	30	12	13	11	4	7	3	4	9	13	8	0	8	0	0	0	0	0	A.
6.3	4.8	3.7	4.9	4,732	27	NE.	NE., SE., S., SW.	13	14	5	14	14	14	3	6	10	9	14	8	0	16	0	0	0	6	0	M.
6.3	6.4	5.0	5.9	3,634	20	SE.	NE., E., SW.	6	12	12	11	9	12	5	3	20	6	13	11	0	17	0	0	1	5	0	J.
5.5	4.9	3.9	4.8	3,185	26	SW.	S.	7	7	5	18	22	13	3	2	16	12	10	9	0	12	0	0	3	5	0	J.
6.1	6.9	4.7	5.9	3,280	23	N.	NE.	5	19	8	16	12	12	5	8	8	6	12	13	0	17	0	0	1	5	0	A.
4.2	4.6	4.6	4.5	4,254	21	N.	NE.	8	33	5	14	11	8	4	3	4	11	13	6	0	8	0	0	0	1	0	S.
3.9	3.9	2.1	3.3	4,148	21	NE.	NE.	17	28	7	5	8	7	8	8	5	15	12	4	0	3	0	0	0	0	0	O.
5.2	5.1	3.0	4.4	5,323	34	SW.	W.	8	8	4	9	14	11	17	15	4	10	14	6	0	9	0	1	0	1	0	N.
6.0	5.9	5.3	5.7	4,921	23	NW., N	N.	19	15	0	0	18	6	9	15	11	7	11	13	0	15	1	15	0	0	0	D.
5.1	5.2	3.8	4.7	54,277	..	....	NE.	155	202	72	114	150	118	84	97	103	122	150	93	1	138	9	60	5	23	0	Y.

NORTH PLATTE, NEBR.

[H = 2,841. T = 21. h = 34.]

Cloudiness (in tenths).				Wind.													Number of days.										Months and year.
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Directions.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
3.9	4.5	3.1	3.8	5,748	32	NW.	NW.	11	4	7	12	9	4	6	37	3	10	19	2	0	6	17	30	0	0	0	J.
3.1	4.0	3.0	3.4	5,429	30	NW.	W.	3	4	9	8	7	11	22	18	2	17	6	5	0	5	3	23	0	0	0	F.
5.0	5.2	5.1	5.1	6,271	36	SE.	NW.	9	5	5	10	9	12	19	21	3	8	16	7	0	7	8	27	0	0	0	M.
5.4	6.4	4.9	5.6	7,958	48	SE.	SE.	4	3	17	24	9	7	13	10	3	7	15	8	0	11	1	7	0	1	0	A.
4.0	4.4	3.8	4.1	6,131	32	SE., NW	SE.	14	9	11	16	14	10	11	7	1	8	20	3	0	11	0	0	1	8	0	M.
3.9	5.0	3.7	4.2	6,360	36	SE.	S.	12	10	16	16	21	1	7	7	0	10	18	2	0	8	0	0	0	7	0	J.
3.6	3.4	3.5	3.5	6,356	40	SE.	S.	7	8	17	23	27	5	4	1	1	15	14	2	0	4	0	0	14	5	0	J.
2.8	3.2	3.1	3.0	6,124	32	S.	SE.	8	7	14	27	17	9	4	6	1	17	14	0	0	9	0	0	16	8	0	A.
3.1	3.2	1.5	2.6	5,826	32	S.	N.	21	3	6	14	14	6	14	11	1	20	9	1	0	3	0	0	1	1	0	S.
2.9	3.6	2.1	2.9	6,662	60	S.	S.	7	6	16	18	23	4	8	11	0	17	13	1	0	3	0	2	0	1	0	O.
2.4	3.2	3.1	2.9	6,907	40	N.	W.	12	1	5	4	6	5	34	20	3	16	12	2	0	4	5	21	0	0	0	N.
2.3	5.2	3.7	3.7	5,828	34	NW.	W., NW	8	4	7	17	8	9	19	19	2	15	13	3	0	6	12	31	0	0	0	D.
3.5	4.3	3.4	3.7	75,600	..	....	SE.	116	64	130	189	164	83	161	168	20	160	169	36	0	77	46	141	32	31	0	Y.

Monthly and yearly meteorological summaries—Continued.

OLYMPIA, WASH.

[Latitude, 47° 3′ N.; longitude, 122° 53′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J ...	29.950	30.55	29.16	34.7	38.3	36.8	36.6	53	15	41.9	30.7	32	34	33	33	92	86	87	88	9.47	1.90
F ...	30.089	30.58	29.62	40.5	45.6	43.7	43.3	61	26	49.5	37.5	38	40	41	40	92	83	90	88	3.39	0.56
M ..	30.000	30.45	29.68	36.3	47.1	43.9	42.4	65	23	51.8	33.9	34	38	39	37	91	73	84	82	4.07	0.65
A ...	29.939	30.41	29.38	40.7	53.1	49.7	47.8	72	30	58.1	38.9	38	41	41	40	91	66	74	77	4.04	0.80
M ..	30.006	30.33	29.70	44.5	60.5	57.5	54.2	82	30	66.3	42.7	43	47	48	46	95	62	71	76	1.90	0.51
J ...	30.005	30.20	29.77	49.4	66.7	63.7	59.9	92	36	72.6	47.7	48	51	51	50	95	59	66	73	1.26	0.45
J ...	29.965	30.16	29.73	51.7	70.0	68.5	63.4	87	45	76.7	50.0	51	57	58	55	96	63	70	76	1.15	0.45
A ...	29.947	30.20	29.74	53.5	70.0	66.7	63.4	86	45	76.5	51.7	51	56	57	55	93	63	72	76	0.42	0.35
S ...	30.002	30.33	29.68	50.0	63.4	57.4	56.9	83	35	69.2	46.7	48	53	52	51	94	69	82	82	3.17	1.65
O ...	30.036	30.31	29.69	44.3	52.9	48.2	48.5	66	34	56.5	41.7	43	48	46	46	96	84	92	90	4.15	1.09
N ...	30.181	30.70	29.45	39.0	45.8	41.6	42.1	57	27	49.3	35.5	37	41	39	39	93	83	92	89	1.73	0.39
D ...	29.941	30.42	29.53	43.3	45.9	44.5	44.6	60	31	49.2	39.9	42	44	43	43	95	92	94	94	13.38	2.50
Y ...	30.005	30.70	29.16	44.0	54.9	51.8	50.2	92	15	59.8	41.4	42	46	46	45	94	74	81	83	48.13	....

OMAHA, NEBR.

[Latitude, 41° 16′ N.; longitude, 95° 56′ W.]

J ...	28.967	29.45	28.38	4.3	10.6	7.0	7.3	42	-24	17.0	- 0.4	1	5	4	3	85	79	85	83	1.15	0.33
F ...	28.904	29.46	28.30	18.7	29.8	24.7	24.4	64	-19	38.0	14.8	15	20	20	18	85	69	81	78	0.36	0.14
M ..	28.832	29.31	28.29	26.9	37.0	31.8	31.9	64	- 1	43.2	24.7	23	28	27	26	85	74	82	80	1.31	0.34
A ...	28.809	29.23	28.30	44.0	57.6	51.0	50.9	85	18	64.1	41.8	38	39	41	40	82	54	70	69	1.77	0.74
M ..	28.802	29.10	28.39	57.0	73.7	64.6	65.1	93	41	77.9	54.1	51	49	54	51	81	44	68	65	4.58	1.15
J ...	28.837	29.21	28.50	63.7	78.2	68.7	70.2	92	47	82.1	60.5	58	58	60	59	82	51	74	69	1.50	0.57
J ...	28.823	29.01	28.62	68.8	86.8	76.3	77.3	100	59	89.5	66.7	60	59	62	60	73	41	62	58	0.69	0.69
A ..	28.801	29.00	28.55	67.8	83.4	75.6	75.6	99	44	86.9	66.9	62	62	62	62	82	50	65	66	2.53	0.98
S ...	28.830	29.11	28.42	58.0	73.3	64.5	65.3	93	40	77.9	55.8	53	53	55	54	85	51	73	70	4.45	1.12
O ...	28.946	29.43	28.41	49.1	67.6	58.2	58.3	85	16	70.0	47.4	44	45	46	45	83	46	65	65	1.33	0.82
N ...	28.858	29.26	28.26	28.6	41.0	33.1	34.2	73	9	45.5	25.9	22	25	22	23	79	55	68	67	1.54	1.28
D ...	29.004	29.58	28.56	14.4	22.6	16.8	17.9	55	-15	29.7	8.6	10	14	12	12	84	69	80	78	1.46	0.78
Y ...	28.868	29.58	28.26	41.8	55.1	47.7	48.2	100	-24	60.2	38.9	36	38	39	38	82	57	73	71	22.67	....

OSWEGO, N. Y.

[Latitude, 43° 29′ N.; longitude, 76° 35′ W.]

J ...	29.658	30.39	28.67	17.3	21.0	19.1	19.1	52	-17	26.4	11.9	15	17	16	16	90	84	87	87	3.29	2.02
F ...	29.669	30.19	28.89	18.6	23.8	21.3	21.2	49	-15	29.2	13.4	15	17	16	16	86	76	82	81	2.19	0.61
M ..	29.553	30.09	28.91	27.1	32.4	30.4	30.0	68	- 4	36.8	23.9	22	25	25	24	82	74	80	78	3.73	1.42
A ...	29.738	30.12	29.20	43.2	48.4	44.7	45.4	74	25	53.1	38.0	36	37	37	36	76	66	75	73	3.66	2.19
M ..	29.546	29.92	29.22	50.1	56.1	50.8	52.3	76	37	60.3	44.4	43	42	42	42	77	63	73	71	1.92	0.78
J ...	29.592	29.87	29.10	59.0	65.9	59.0	61.3	81	43	69.6	52.8	52	51	50	51	77	60	74	70	1.03	0.34
J ...	29.575	29.87	29.34	63.8	70.7	64.4	66.3	88	49	73.7	57.8	57	55	58	56	78	60	80	73	4.24	1.24
A ...	29.596	29.92	29.29	62.8	71.4	64.7	66.3	89	48	74.4	58.9	56	58	58	58	80	66	79	75	2.58	1.01
S ...	29.711	30.08	29.29	57.0	65.4	58.7	60.4	88	40	68.6	52.7	51	53	52	52	80	65	79	75	4.30	0.97
O ...	29.782	30.13	29.16	46.8	54.6	49.5	50.3	72	29	58.1	42.6	41	44	44	43	80	70	82	77	2.12	0.44
N ...	29.579	30.09	28.97	36.0	40.1	37.4	37.8	68	17	44.8	30.8	30	30	29	30	79	70	73	74	4.07	1.72
D ...	29.721	30.27	28.98	20.9	24.6	22.6	22.7	47	- 4	29.3	14.7	17	18	18	18	87	78	83	83	2.33	1.01
Y ...	29.643	30.39	28.67	41.9	47.9	43.6	44.5	89	-17	52.0	36.8	36	37	37	37	81	69	79	76	35.46	....

PALESTINE, TEX.

[Latitude, 31° 45′ N.; longitude, 95° 40′ W.]

J ...	29.566	30.09	29.12	34.0	45.3	38.7	39.3	75	0	50.0	29.8	30	31	32	31	83	60	78	74	3.65	1.28
F ...	29.564	30.05	29.11	42.4	58.0	50.1	50.2	82	24	61.8	40.2	36	40	40	39	80	54	70	68	3.95	1.66
M ..	29.478	29.77	29.01	49.5	60.9	54.7	55.0	80	27	65.8	46.8	44	44	46	45	82	58	75	71	4.62	1.53
A ...	29.466	29.83	29.13	57.7	70.7	62.3	63.6	84	36	73.9	55.4	54	53	53	53	86	58	74	73	2.75	0.93
M ..	29.456	29.69	29.25	66.6	82.6	72.2	73.8	92	52	85.3	64.5	61	61	62	62	83	50	72	68	0.30	0.30
J ...	29.385	29.56	29.15	72.4	86.0	75.3	77.9	97	65	88.7	70.4	68	67	69	68	86	54	81	74	2.37	1.21
J ...	29.420	29.62	29.21	74.4	88.1	79.1	80.5	97	65	91.8	72.7	71	70	72	71	89	57	80	75	3.31	1.31
A ...	29.440	29.60	29.24	74.3	90.1	79.1	81.2	98	65	93.3	72.9	69	67	70	69	85	49	75	69	1.32	0.97
S ...	29.478	29.71	29.21	70.1	84.4	74.5	76.3	95	55	86.8	68.8	66	66	67	66	87	56	80	74	7.12	4.44
O ...	29.622	29.87	29.12	56.9	73.7	62.8	64.5	84	40	75.2	55.7	52	54	55	54	84	52	76	70	1.95	1.37
N ...	29.604	30.01	29.16	48.5	62.1	54.1	54.9	80	26	66.3	45.4	42	43	45	43	79	51	74	68	1.42	0.54
D ...	29.622	30.00	29.27	42.6	53.5	46.3	47.5	72	14	58.4	38.4	36	36	38	37	80	54	73	69	0.45	0.15
Y ...	29.508	30.09	29.01	57.4	71.3	62.4	63.7	98	0	74.8	55.1	52	53	54	53	84	54	76	71	33.21	....

Monthly and yearly meteorological summaries—Continued.

OLYMPIA, WASH.

[$H=36$. $T=46$. $h=41$.]

Cloudiness (in tenths.)				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.0	7.7	7.3	7.3	3,815	23	NE.	S.	12	12	1	6	42	13	0	1	6	3	10	18	0	21	3	15	0	0	0	J.
6.2	8.7	7.3	7.4	2,817	19	W.	S.	14	7	2	6	25	18	3	3	6	2	9	17	0	17	0	6	0	0	0	F.
4.8	5.6	4.5	5.0	3,791	20	S.	S.	13	9	0	4	44	18	1	1	3	11	10	10	0	18	0	10	0	0	0	M.
6.6	6.6	4.9	6.0	3,071	21	SW.	S.	13	2	1	4	32	20	13	3	1	6	10	14	0	16	0	1	0	0	0	A.
5.4	5.4	4.2	5.0	3,000	16	S.	S.	16	7	0	4	28	20	5	6	6	11	10	10	0	12	0	1	0	1	0	M.
5.6	5.1	4.5	5.1	3,014	16	NE.	S.	22	5	1	1	30	7	17	4	3	10	10	10	0	10	0	0	1	0	0	J.
4.3	4.3	2.7	3.8	2,760	14	S.	N.	29	16	3	1	21	5	8	7	3	13	12	6	0	8	0	0	0	1	0	J.
4.2	2.9	2.6	3.2	2,524	16	S.	N.	34	10	0	0	11	13	10	8	7	16	10	5	0	4	0	0	0	0	0	A.
4.2	3.8	2.4	3.5	2,507	18	W.	N., S.	19	17	3	2	19	13	6	6	5	16	8	6	0	6	0	0	0	0	0	S.
5.3	7.3	5.4	6.0	2,132	20	W.	S.	18	8	5	0	34	10	4	8	6	7	11	13	0	15	0	0	0	0	0	O.
6.3	6.8	4.7	5.9	2,673	21	S.	S.	8	3	6	2	43	17	1	6	4	3	18	9	0	12	0	12	0	0	0	N.
7.6	9.2	7.2	8.0	3,354	17	S.	S.	4	4	0	1	56	13	2	5	8	1	10	20	0	27	0	1	0	0	0	D.
5.6	6.1	4.8	5.5	35,458	..	....	S.	202	100	22	31	385	167	70	58	58	99	128	138	0	166	3	46	1	2	0	Y.

OMAHA, NEBR.

[$H=1,113$. $T=86$. $h=76$.]

5.2	6.3	4.6	5.4	8,749	38	N., NW	N.	29	1	3	6	17	3	2	28	4	8	16	7	0	15	27	31	0	0	0	J.
2.5	4.4	2.8	3.2	5,881	34	NW.	NW.	14	6	2	5	18	5	2	21	11	16	9	3	0	5	8	27	0	0	0	F.
6.5	5.6	4.7	5.6	6,439	36	N.	NW.	15	4	7	13	15	2	5	28	4	8	12	11	0	7	3	24	0	0	0	M.
5.6	6.4	3.1	5.0	6,331	34	NW.	SE.	8	9	4	24	12	3	4	17	9	9	15	6	0	10	0	7	0	3	0	A.
4.1	4.1	3.1	3.8	4,269	29	N.	N.	19	5	7	14	15	6	3	9	15	11	17	3	0	13	0	0	2	6	0	M.
3.1	5.3	2.8	3.7	3,964	32	SE.	S.	16	1	1	15	17	5	5	7	23	12	16	2	0	9	0	0	4	5	0	J.
3.8	3.1	2.5	3.1	4,012	24	N.	S.	13	9	3	7	29	6	2	8	16	18	9	4	0	1	0	0	11	2	0	J.
4.6	4.6	3.4	4.2	4,318	22	N.	S.	16	3	3	15	31	2	0	12	11	13	12	6	0	8	0	0	8	5	0	A.
4.6	5.8	4.7	5.0	5,534	24	S. SW. NW.	S.	16	2	1	7	35	9	1	10	9	8	16	6	0	18	0	0	2	7	0	S.
4.6	4.2	3.6	4.1	5,598	30	S.	S.	6	4	1	9	43	7	2	8	13	13	12	6	0	6	0	4	0	2	0	O.
3.5	6.1	4.3	4.6	7,210	37	NW.	NW.	15	3	2	8	16	5	8	25	8	11	12	7	0	6	3	23	0	0	0	N.
4.4	5.5	4.8	4.9	5,732	30	N.	N., S.	22	5	2	5	22	4	2	18	13	11	12	8	0	6	18	28	0	0	0	D.
4.4	5.1	3.7	4.4	68,037	..	....	S.	189	52	36	128	270	57	36	191	136	138	158	69	0	104	59	144	27	30	0	Y.

OSWEGO, N. Y.

[$H=335$. $T=76$. $h=83$.]

9.3	8.6	8.8	8.9	9,906	39	W.	SE.	7	7	4	21	19	3	13	17	2	2	2	27	0	18	18	29	0	0	0	J.
8.5	8.0	7.5	8.0	9,100	40	NW.	S.	12	6	2	12	18	12	5	12	5	3	5	20	0	14	14	23	0	0	0	F.
7.8	6.9	6.6	7.1	9,130	40	SE.	NW.	8	7	7	15	12	3	12	27	2	4	9	18	0	12	8	24	0	1	0	M.
5.4	6.2	4.1	5.2	7,033	33	SW.	NE.	9	20	2	10	15	9	14	6	5	8	15	7	1	12	2	9	0	0	1	A.
5.3	4.7	4.5	4.8	6,709	33	S.	W.	8	1	2	7	22	2	35	11	5	10	13	8	0	8	0	0	0	2	2	M.
5.4	4.6	4.3	4.8	6,251	26	SE.	S.	9	4	1	19	25	2	22	6	2	11	11	8	0	10	0	0	0	3	2	J.
4.9	3.6	3.8	4.1	5,528	24	N.	W.	10	4	2	9	23	8	26	10	1	15	8	8	0	12	0	0	0	6	1	J.
5.5	4.1	4.2	4.6	6,418	30	NW.	S.	13	3	2	5	31	8	13	18	0	8	16	7	0	7	0	0	0	4	0	A.
5.6	4.1	4.4	4.7	7,034	32	W.	S.	9	3	3	14	30	7	13	11	0	10	11	9	0	15	0	0	0	2	1	S.
6.3	6.0	5.4	5.9	7,790	36	S.	S.	10	10	4	7	29	5	8	17	3	9	8	14	0	12	0	1	0	1	2	O.
8.6	8.6	7.8	8.3	11,167	41	W.	NW.	3	10	1	8	20	12	14	22	0	0	9	21	0	17	3	19	0	1	0	N.
8.6	8.6	7.6	8.3	9,551	33	NW.	S.	1	6	4	15	22	15	13	17	0	2	6	23	0	14	17	28	0	0	0	D.
6.8	6.2	5.8	6.3	95,627	..	....	S.	99	81	34	142	266	86	188	174	25	82	113	170	1	151	62	133	0	20	9	Y.

PALESTINE, TEX.

[$H=533$. $T=33$. $h=2$.]

5.0	4.9	4.0	4.6	7,948	40	NW.	NW.	12	13	8	5	19	5	1	30	0	14	9	8	0	11	3	16	0	2	0	J.
3.8	4.6	3.9	4.1	6,825	32	S.	S.	5	14	5	11	21	10	5	12	1	12	9	7	0	9	0	5	0	1	0	F.
6.0	5.3	4.6	5.3	7,493	32	NW.	S.	12	12	6	10	26	6	3	18	0	10	10	11	0	11	0	2	0	1	0	M.
5.7	5.8	2.9	4.8	6,029	32	SW.	S.	16	3	6	13	35	6	4	7	0	13	9	8	0	10	0	0	0	4	0	A.
3.8	3.9	1.3	3.0	6,424	26	S.	S.	8	10	8	5	43	12	1	4	2	16	13	2	0	2	0	0	4	2	0	M.
5.0	5.2	3.4	4.5	5,492	48	NW.	S.	15	16	7	7	26	11	0	8	0	10	15	5	0	9	0	0	15	5	0	J.
2.9	6.3	3.3	4.2	5,036	30	NE.	S.	2	5	11	14	49	11	1	0	0	13	13	5	0	12	0	0	24	7	0	J.
3.7	4.1	1.4	3.1	5,435	39	SW.	S.	11	10	7	10	44	7	3	1	0	16	13	2	0	6	0	0	27	3	0	A.
5.0	6.4	3.5	5.0	6,058	32	SE.	S.	1	16	22	15	27	4	0	5	0	11	10	9	0	9	0	0	11	2	0	S.
3.3	4.0	1.8	3.0	5,676	28	NW.	NE., S.	13	22	10	19	22	1	3	3	0	19	9	3	0	5	0	0	0	2	0	O.
4.6	4.9	3.3	4.3	7,163	28	NW.	S.	12	12	5	8	27	12	4	10	0	12	12	6	0	8	0	3	0	0	0	N.
4.7	4.4	4.1	4.4	7,339	33	S.	S.	14	10	8	16	19	5	4	17	0	14	7	10	0	7	1	8	0	1	0	D.
4.5	5.0	3.1	4.2	76,918	..	....	S.	121	143	103	133	358	90	29	115	3	160	129	76	0	99	4	34	81	30	0	Y.

Monthly and yearly meteorological summaries—Continued.

PENSACOLA, FLA.

[Latitude, 30° 25′ N.; longitude, 87° 13′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J...	30.047	30.58	29.55	43.4	50.2	45.3	46.3	67	15	53.3	39.0	38	40	38	39	80	71	78	76	5.30	1.38
F...	30.117	30.62	29.76	45.6	57.2	50.8	51.2	71	20	59.9	43.6	37	41	41	40	75	60	72	69	2.18	1.29
M.	30.015	30.33	29.60	53.9	61.7	57.0	57.5	74	38	64.8	51.6	49	50	50	50	84	69	80	77	13.37	2.65
A...	30.020	30.24	29.63	61.4	70.3	64.2	65.3	82	39	72.5	58.8	55	57	57	56	80	66	77	74	6.83	2.84
M..	29.989	30.18	29.80	69.5	79.6	72.3	73.8	89	55	81.4	67.5	63	65	66	64	81	62	80	74	.75	.72
J...	29.915	30.14	29.77	78.0	84.9	78.2	80.4	93	69	87.5	74.9	72	73	72	73	83	69	83	78	7.67	2.32
J...	29.928	30.14	29.73	76.9	84.3	79.3	80.2	91	69	87.2	74.9	73	74	73	73	87	73	82	81	8.85	1.95
A...	29.939	30.16	29.71	77.3	86.0	79.4	80.9	96	70	88.8	75.5	73	75	74	74	86	70	83	80	8.82	3.07
S...	30.022	30.15	29.91	75.0	84.3	77.9	79.1	89	60	85.8	73.6	70	73	71	71	84	69	80	78	1.29	.51
O...	30.095	30.29	29.77	62.9	76.6	67.4	69.0	84	41	78.3	61.6	56	62	58	59	78	62	74	71	.20	.16
N...	30.131	30.43	29.77	52.7	65.5	57.0	58.4	79	34	67.7	49.4	46	52	49	49	80	65	77	74	2.76	1.26
D...	30.123	30.36	29.76	47.3	56.8	49.9	51.3	72	26	60.4	43.7	41	46	43	43	81	69	78	76	4.13	2.17
Y...	30.029	30.62	29.55	62.0	71.4	64.9	66.1	96	15	74.0	59.5	56	59	58	58	82	67	79	76	62.15	....

PHILADELPHIA, PA.

[Latitude, 39° 57′ N.; longitude, 75° 9′ W.]

J...	29.922	30.74	28.57	26.6	32.5	29.0	29.4	58	4	36.3	23.6	20	24	22	22	76	71	74	74	3.69	1.08
F...	29.954	30.40	29.18	26.6	35.6	30.5	30.9	66	-2	40.5	23.3	21	25	21	23	80	68	70	72	4.62	1.74
M..	29.819	30.34	29.18	35.6	45.9	38.4	40.0	67	8	48.4	31.9	28	29	30	29	75	56	74	68	3.17	0.73
A...	29.990	39.44	29.25	48.1	60.8	51.2	53.4	84	29	64.3	44.8	43	45	44	44	83	60	78	74	2.70	1.35
M..	29.813	30.22	29.47	56.6	67.4	58.7	60.9	86	46	70.2	52.8	50	52	52	51	79	61	80	73	4.50	1.89
J...	29.866	30.19	29.42	64.0	75.9	65.8	68.6	86	54	78.5	60.5	58	59	59	59	82	58	80	73	2.86	0.76
J...	29.831	30.14	29.62	69.2	82.0	72.7	74.6	94	59	84.7	66.8	64	64	66	64	83	56	80	73	4.23	0.83
A...	29.870	30.22	29.52	68.6	80.4	70.7	73.2	92	56	82.5	66.2	64	65	65	65	86	61	84	77	1.38	0.65
S...	30.020	30.32	29.60	63.8	77.0	66.9	69.2	91	51	79.3	60.8	57	57	59	58	80	52	77	70	1.20	0.64
O...	30.060	30.42	29.70	52.8	65.6	56.1	58.2	84	37	67.8	50.6	46	45	47	46	78	51	73	67	1.89	1.06
N...	29.913	30.35	29.38	42.4	51.9	45.3	46.5	73	27	54.9	38.6	32	32	35	33	67	49	68	61	3.91	1.17
D...	30.020	30.48	29.39	28.1	34.4	30.6	31.0	55	13	37.7	25.0	20	23	23	22	74	66	73	71	3.09	1.03
Y...	29.923	30.74	28.57	48.5	59.1	51.3	53.0	94	-2	62.1	45.4	42	43	44	43	79	59	76	71	37.24	....

PIKE'S PEAK, COLO.

[Latitude, 38° 50′ N.; longitude, 105° 2′ W.]

J...	17.443	17.76	17.12	0.3	3.6	2.0	2.0	19	-30	8.4	-4.0	-2	2	(*)	(*)	91	91	90	91	4.04	1.08
F...	17.628	18.09	17.24	4.4	9.2	5.1	6.2	27	-19	11.7	1.2	(*)	4	1	2	83	79	82	81	.84	.36
M..	17.472	17.88	17.07	1.4	7.5	3.0	4.0	27	-16	10.9	-2.1	-1	5	1	2	91	90	93	92	4.72	.93
A...	17.623	17.94	17.25	9.1	15.6	11.6	12.1	28	-4	17.8	7.6	7	12	8	9	90	85	87	87	6.33	2.18
M..	17.943	18.18	17.65	22.3	33.0	26.1	27.1	46	8	34.8	21.5	16	26	20	21	76	74	78	76	.40	.21
J...	18.017	18.17	17.76	29.6	37.3	32.0	33.0	52	24	39.7	28.4	25	32	28	28	81	83	84	83	2.44	1.06
J...	18.146	18.28	18.00	38.6	47.8	41.1	42.5	57	35	49.8	37.9	30	35	33	33	73	62	75	70	3.30	.72
A...	18.110	18.24	17.94	37.2	44.8	39.5	40.5	52	29	47.3	35.9	32	37	35	35	83	77	85	82	3.18	.69
S..	17.959	18.13	17.73	28.8	37.7	31.4	32.6	49	21	40.5	27.5	23	30	26	26	80	73	81	78	.71	.24
O...	17.851	18.07	17.47	19.0	26.0	21.4	22.1	57	4	28.9	17.0	12	20	16	16	76	78	82	78	1.31	.49
N...	17.597	17.96	16.94	5.0	9.0	7.3	7.1	24	-27	13.5	2.3	-1	2	(*)	1	78	77	76	77	1.07	.49
D...	17.627	17.94	17.30	7.0	10.7	8.1	8.6	23	-9	14.4	3.3	2	4	2	3	82	76	79	79	1.17	.39
Y...	17.785	18.28	16.94	16.9	23.5	19.0	19.8	57	-30	26.5	14.7	12	17	14	14	82	79	83	81	29.51	....

PITTSBURG, PA.

[Latitude, 40° 32′ N.; longitude, 80° 2′ W.]

J...	29.111	29.78	28.27	25.4	30.8	26.1	27.4	61	-5	35.4	19.7	22	25	21	23	86	78	83	82	3.21	.85
F...	29.178	29.71	28.46	25.4	36.2	29.3	30.3	63	-3	39.5	21.6	22	28	24	25	85	74	82	81	1.39	.46
M..	29.042	29.40	28.36	35.6	46.6	38.9	40.4	71	11	50.4	32.4	32	37	33	34	87	69	81	79	2.85	.67
A...	29.150	29.53	28.52	48.0	64.5	53.5	55.3	85	30	66.8	46.3	43	47	46	46	84	56	77	72	4.03	2.38
M..	29.040	29.43	28.74	55.9	72.2	60.4	62.8	89	41	74.9	52.4	51	56	54	53	83	57	79	73	3.51	1.03
J...	29.076	29.31	28.73	61.4	77.0	65.4	67.9	92	45	79.2	58.2	57	61	59	59	85	59	81	75	5.17	1.76
J...	29.064	29.30	28.85	65.4	83.5	70.3	73.1	96	53	85.9	63.2	61	64	64	63	86	53	80	73	5.56	2.10
A...	29.099	29.40	28.79	65.9	80.9	69.6	72.1	93	52	83.6	63.9	62	65	64	64	87	60	83	77	2.85	1.05
S...	29.214	29.49	29.87	60.4	76.4	64.9	67.2	92	47	79.1	58.3	57	62	60	59	88	61	83	78	2.86	1.30
O...	29.274	29.53	28.62	48.2	64.2	53.0	55.1	79	35	66.6	46.1	44	45	46	45	86	51	80	72	1.06	.37
N...	29.121	29.51	28.54	37.9	46.4	40.7	41.7	69	22	50.2	34.5	31	32	33	32	78	61	74	71	4.91	1.12
D...	29.201	29.40	28.56	26.6	33.4	28.4	29.5	58	7	37.8	22.1	21	24	24	23	80	70	84	78	1.81	.57
Y...	29.131	29.78	28.27	46.3	59.3	50.0	51.9	96	-5	62.4	43.2	42	45	44	44	85	63	80	76	39.21	....

* Zero.

Monthly and yearly meteorological summaries—Continued.

PENSACOLA, FLA.

[H=30. T=20. h=35.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.0	5.9	4.5	5.5	5,812	28	W.	N.	21	11	17	9	8	2	10	15	0	7	17	7	1	14	3	8	0	3	0	J.
4.7	4.5	3.4	4.2	5,021	21	S.	NE.	15	18	7	16	10	8	6	4	0	13	9	6	0	7	0	3	0	1	0	F.
6.4	5.5	4.2	5.4	5,556	28	S.	S.	11	15	8	14	19	4	11	9	2	9	11	11	1	18	0	0	0	4	0	M.
4.5	5.1	4.0	4.5	5,909	33	S.	S.	8	8	10	18	25	10	2	8	1	12	13	5	0	10	0	0	0	5	0	A.
3.7	2.6	2.5	2.9	6,542	29	SE.	SW.	10	5	1	4	10	44	13	0	6	16	13	2	0	2	0	0	0	2	0	M.
4.7	6.0	3.0	4.6	5,274	25	S.	S.	12	10	5	11	24	19	1	1	7	8	17	5	0	14	0	0	5	6	0	J.
5.9	5.5	2.6	4.7	4,278	24	W.	SW.	6	5	4	1	13	30	17	8	9	5	23	3	0	20	0	0	2	9	0	J.
4.9	5.5	2.9	4.4	4,862	24	S.	SW.	8	11	10	10	7	21	16	7	3	9	17	5	0	15	0	0	9	6	0	A.
4.3	4.7	2.6	3.9	5,586	24	E., SE.	E.	7	9	23	17	11	14	3	3	3	10	17	3	0	10	0	0	0	1	0	S.
2.8	2.4	1.5	2.2	5,535	27	E.	N.	31	16	16	12	7	4	3	4	0	22	6	3	0	3	0	0	0	0	0	O.
4.0	4.8	2.8	3.9	4,922	29	W.	N.	29	7	6	5	16	12	5	8	2	13	11	6	0	8	0	0	0	1	0	N.
6.0	4.8	3.4	4.7	4,615	37	SE.	NE.	21	23	16	9	5	4	4	11	0	12	7	12	0	10	0	4	0	1	0	D.
4.8	4.8	3.1	4.2	63,912	..	....	N.	179	138	123	126	155	172	91	78	33	136	161	68	2	131	3	15	16	39	0	Y.

PHILADELPHIA, PA.

[H=117. T=168. h=166.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.9	6.4	5.2	5.8	9,000	40	NE.	NW.	16	20	5	5	2	4	5	34	1	7	12	11	0	13	9	24	0	0	0	J.
4.5	4.8	2.8	4.0	9,512	48	NW.	NW.	4	12	3	4	10	16	7	28	0	11	13	4	1	8	6	22	0	0	0	F.
5.1	6.3	3.9	5.1	8,969	36	NW.	NW.	4	10	4	5	9	15	3	41	2	8	15	8	0	12	2	15	0	2	0	M.
5.7	6.3	5.3	5.8	6,546	43	SW.	NE.	6	25	12	2	6	17	4	8	10	5	14	11	0	7	0	2	0	1	0	A.
6.2	6.6	4.5	5.8	7,264	35	N.	S.	6	11	7	9	19	17	3	18	3	8	12	11	0	17	0	0	0	6	1	M.
6.4	6.7	2.8	5.3	5,924	26	W., E.	SW.	6	6	14	9	16	19	9	11	0	9	11	9	0	8	0	0	0	2	0	J.
5.7	4.1	4.2	4.7	5,224	36	NW.	S.	11	7	10	8	20	13	13	11	0	10	13	8	0	12	0	0	5	8	1	J.
5.1	5.8	2.8	4.6	5,711	36	NW.	S., W.	7	11	7	8	17	15	17	10	1	11	13	7	0	6	0	0	3	1	0	A.
5.9	5.3	4.7	5.3	5,980	28	SW.	S.	8	11	11	6	20	15	7	12	0	11	10	8	0	9	0	0	2	2	0	S.
3.9	4.5	3.3	3.9	7,015	28	NW.	NW.	13	12	9	8	7	12	10	20	2	16	7	8	0	6	0	0	0	1	0	O.
4.9	4.9	3.5	4.4	7,832	40	SW.	NW.	3	8	2	3	19	5	16	33	1	14	8	8	0	10	0	6	0	2	0	N.
6.1	5.9	4.5	5.5	8,866	34	NW.	NW.	3	23	1	1	9	13	16	27	0	9	12	10	1	12	9	25	0	0	0	D.
5.4	5.6	4.0	5.0	87,843	..	....	NW.	87	156	85	68	154	161	110	253	20	119	140	103	2	120	26	94	10	25	2	Y.

PIKE'S PEAK, COLO.

[H=14,134. T=5. h=1.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.0	5.3	2.9	3.7	19,003	88	W.	W.	14	11	3	2	1	14	29	19	0	13	13	5	2	13	31	31	0	0	0	J.
2.6	4.1	2.8	3.2	17,843	76	W.	W.	17	16	1	0	2	3	24	21	0	14	12	2	0	8	28	28	0	0	0	F.
2.8	4.5	4.1	3.8	20,153	76	W.	W.	8	15	0	0	2	24	25	18	1	13	15	3	2	15	31	31	0	0	0	M.
3.3	5.8	4.2	4.4	14,950	88	W.	W.	5	6	3	3	4	17	27	22	3	11	12	7	1	15	30	30	0	3	0	A.
1.0	3.9	2.0	2.6	14,717	74	W.	SW.	19	3	3	0	2	27	25	9	5	21	9	1	0	7	15	28	0	8	0	M.
1.6	6.0	2.8	3.5	10,062	64	SW.	SW.	14	10	4	3	6	21	16	14	2	11	19	0	1	19	3	25	0	20	0	J.
1.8	5.6	2.7	3.4	8,900	61	W.	W.	5	14	14	6	6	9	23	11	5	14	17	0	0	19	0	0	0	14	1	J.
2.6	6.6	4.8	4.7	7,253	40	W.	W.	10	15	7	8	7	14	24	6	2	7	21	3	1	23	0	3	0	18	0	A.
1.6	4.6	0.7	2.3	11,869	64	W.	W.	4	6	4	2	4	22	34	10	4	20	10	0	1	6	0	25	0	1	0	S.
2.1	3.7	2.8	2.9	15,401	76	SW.	SW.	9	4	5	3	9	28	24	9	2	17	13	1	0	8	24	31	0	1	0	O.
1.7	2.5	1.9	2.0	21,085	86	W.	N., W.	21	11	1	1	1	15	21	19	0	20	9	1	1	10	30	30	0	0	0	N.
3.1	3.1	1.7	2.6	23,649	80	W.	NW.	16	14	2	0	0	4	25	30	2	18	11	2	0	8	31	31	0	0	0	D.
2.3	4.6	2.8	3.2	184,885	..	....	W.	142	125	47	28	44	198	297	188	26	179	161	25	9	151	223	293	0	65	1	Y.

PITTSBURG, PA.

[H=847. T=130. h=126.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.7	8.8	6.7	7.7	5,552	35	SW.	NE.	7	19	9	7	12	9	18	11	1	1	13	17	0	17	12	24	0	0	0	J.
6.7	7.5	5.1	6.4	5,553	28	NW.	S.	9	5	4	5	17	14	16	11	3	4	13	11	0	15	11	22	0	0	0	F.
6.1	7.0	5.0	6.0	5,613	22	W.	NW.	7	9	4	6	10	19	15	20	3	4	17	10	0	13	2	15	0	1	0	M.
5.4	6.3	4.1	5.3	4,055	25	S.	SE.	10	11	7	14	9	8	11	11	9	8	13	9	0	13	0	3	0	3	0	A.
6.2	6.8	3.3	5.4	3,938	25	NE.	NW.	4	9	2	7	8	12	11	29	11	5	19	7	0	12	0	0	0	4	0	M.
5.2	7.0	2.7	5.0	3,521	28	SW.	NW.	12	7	10	9	8	8	8	25	3	9	16	5	0	12	0	0	1	4	0	J.
4.3	6.1	3.2	4.5	2,966	25	NW.	NW.	9	6	4	4	12	9	11	26	12	11	15	5	0	12	0	0	7	5	0	J.
5.6	6.7	3.5	5.3	3,421	28	SW.	NW.	15	9	5	9	10	7	9	27	2	9	13	9	0	9	0	0	5	7	0	A.
3.2	6.2	3.2	4.2	3,916	22	SW.	S.	5	14	8	5	21	8	12	16	1	14	13	3	0	12	0	0	3	3	0	S.
4.1	4.6	2.9	3.9	3,833	30	S.	NW.	16	6	2	6	8	10	18	22	5	16	8	7	0	7	0	0	0	0	0	O.
6.7	6.1	5.1	6.0	6,215	32	W.	W.	3	8	2	8	17	14	22	13	3	7	11	12	0	17	1	11	0	0	0	N.
6.8	7.0	4.5	6.1	5,590	28	W.	N.	21	8	4	3	16	11	15	15	0	6	12	13	0	14	9	25	0	0	0	D.
5.7	6.7	4.1	5.5	54,173	..	....	NW.	118	111	61	83	148	129	166	226	53	94	163	108	0	153	35	100	16	27	0	Y.

Monthly and yearly meteorological summaries—Continued.

POPLAR RIVER, MONT.

[Latitude, 48° 8′ N.; longitude, 105° 10′ W.]

Months and year.	Pressure.			Temperature.						Mean.		Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	27.996	28.60	27.44	-15.5	- 0.9	- 7.7	- 8.0	41	-49	4.1	-19.0	-18	5	-11	-11	90	85	88	88	.40	.12
F ..	27.850	28.27	27.38	9.5	22.3	16.8	16.2	50	-33	29.4	5.2	6	16	12	11	84	76	82	81	.38	.11
M .	27.828	28.34	27.27	20.2	34.6	26.1	27.0	70	-12	38.6	14.8	16	25	23	21	85	70	87	81	.20	.09
A ..	27.764	28.26	27.17	34.5	56.4	44.6	45.2	83	12	60.6	30.6	30	38	37	35	82	54	75	70	.86	.67
M .	27.808	28.09	27.42	44.7	67.7	57.1	56.5	93	23	72.8	42.6	38	46	48	44	77	48	75	66	1.35	.47
J ..	27.824	28.27	27.60	55.5	77.9	68.0	67.1	97	33	82.3	51.5	48	53	54	52	76	47	64	62	.80	.40
J ..	27.807	28.08	27.46	67,3	87.9	76.3	77.2	110	46	91.7	61.4	56	55	58	56	68	34	55	52	.94	.40
A ..	27.812	28.08	27.53	56.7	82.1	68.1	69.0	103	35	86.3	53.7	46	47	47	47	70	34	50	51	.51	.26
S ..	27.815	28.11	27.39	41.7	66.1	51.5	53.1	86	17	69.9	36.3	36	47	42	42	82	51	71	68	.21	.10
O ..	27.871	28.39	27.41	32.0	56.7	43.2	44.0	86	16	60.0	29.7	28	43	38	36	84	63	81	76	.40	.35
N ..	27.887	28.41	27.44	14.4	34.2	21.4	23.3	59	-19	38.4	10.1	10	17	16	14	81	55	80	72	.69	.31
D ..	27.944	28.58	27.46	0.8	8.8	4.0	4.5	40	-38	16.7	- 6.3	-2	3	zero	zero	88	79	84	84	.67	.23
Y ..	27.851	28.60	27.17	30.2	49.5	39.1	39.6	110	-49	54.2	25.9	24	32	30	29	80	58	74	71	7.41	....

PORT ANGELES, WASH.

[Latitude, 48° 7′ N.; longitude, 123° 6′ W.]

J ..	29.951	30.57	29.01	30.7	36.2	32.8	33.2	49	7	39.4	23.3	30	33	31	31	97	89	93	93	5.54	1.47
F ..	30.076	30.58	29.60	37.4	44.0	39.6	40.3	58	24	46.9	33.4	36	39	38	38	95	83	94	91	2.98	.69
M .	29.980	30.47	29.62	34.1	45.7	39.4	39.7	57	26	48.3	32.8	33	38	37	36	96	75	92	87	3.23	.99
A ..	29.938	30.37	29.26	39.1	48.7	44.8	44.2	58	30	51.8	37.6	38	42	42	40	94	77	89	87	2.67	.64
M .	30.019	30.34	28.71	41.5	54.3	51.1	49.0	71	31	57.8	40.5	40	46	45	44	94	74	81	83	.77	.31
J ..	30.020	30.19	29.81	47.7	58.1	55.6	53.8	81	39	62.3	46.5	45	50	49	48	92	75	79	82	.70	.21
J ..	29.977	30.18	29.67	50.5	61.4	58.9	56.9	88	40	65.9	49.4	49	54	54	52	95	77	83	85	.46	.26
A ..	29.965	30.22	29.72	49.1	61.6	56.8	55.8	77	43	65.3	48.0	48	54	53	52	96	76	88	87	.88	.64
S ..	30.012	30.39	29.67	46.7	58.0	51.6	52.1	74	34	61.4	44.7	46	51	50	49	97	79	94	90	1.68	.57
O ..	30.035	30.30	29.67	40.6	50.2	44.1	45.0	59	29	52.6	37.8	40	46	43	43	97	86	94	93	1.88	.76
N ..	30.165	30.72	29.43	35.5	45.2	37.8	39.5	54	25	47.5	32.6	34	40	36	37	96	82	93	90	1.46	.26
D ..	29.910	30.42	29.39	39.1	43.5	39.7	40.8	53	25	45.4	35.6	38	42	39	40	97	94	98	96	7.71	1.46
Y ..	30.004	30.72	29.01	41.0	50.6	46.0	45.9	88	7	53.7	38.5	40	44	43	42	96	81	90	89	29.96	....

PORT HURON, MICH.

[Latitude, 43° 0′ N.; longitude, 82° 26′ W.]

J ..	29.316	29.90	28.68	18.6	22.7	18.4	19.9	49	- 5	25.2	13.6	15	18	16	16	85	81	88	85	2.19	.52
F ..	29.348	29.89	28.51	18.3	24.6	21.1	21.3	49	-13	28.1	13.7	14	18	16	16	83	78	82	81	2.11	.64
M .	29.248	29.77	28.45	26.3	34.5	30.4	30.4	53	2	37.4	24.4	22	27	26	25	83	76	84	81	2.82	.56
A ..	29.390	29.75	28.61	39.7	49.7	43.2	44.2	77	19	53.6	36.4	34	39	37	37	81	69	81	77	2.48	.70
M .	29.267	29.63	28.89	48.0	56.3	49.8	51.4	81	33	61.5	42.8	42	44	43	43	81	66	80	76	4.29	1.53
J ..	29.297	29.56	28.90	58.5	67.4	59.1	61.7	86	42	70.5	53.0	52	55	53	54	81	66	81	76	1.02	.26
J ..	29.298	29.54	29.07	62.4	73.8	65.1	67.1	91	46	76.0	58.3	58	59	58	58	85	62	80	76	2.00	.88
A ..	29.298	29.60	28.97	61.5	73.2	64.6	66.4	87	45	75.5	58.9	58	60	58	59	88	66	81	78	2.73	1.15
S ..	29.369	29.69	28.96	55.2	69.8	59.3	61.4	89	38	72.2	52.3	52	55	54	53	89	62	82	78	4.73	1.55
O ..	29.464	29.82	28.53	46.4	59.7	50.7	52.3	78	31	61.6	43.5	43	48	46	45	88	67	83	70	1.31	.53
N ..	29.270	29.70	28.49	33.0	39.3	34.1	35.5	67	17	43.4	28.7	27	30	28	28	79	70	78	76	2.40	1.18
D ..	29.399	29.89	28.78	17.1	24.8	18.9	20.3	46	- 2	26.8	12.4	12	18	13	14	80	75	77	77	1.76	.49
Y ..	29.330	29.90	28.45	40.4	49.6	42.9	44.3	91	-13	52.6	36.5	36	39	37	38	84	70	81	78	29.84	....

PORTLAND, ME.

[Latitude, 43° 39′ N.; longitude, 70° 15′ W.]

J ..	29.903	30.72	28.70	18.8	25.4	19.8	21.3	48	-12	28.2	14.8	15	19	16	16	84	77	84	82	4.65	1.15
F ..	29.851	30.71	28.64	17.6	25.6	21.2	21.5	51	-10	30.0	13.9	13	17	16	15	81	72	81	78	5.52	2.67
M .	29.750	30.52	29.10	25.7	33.7	28.3	29.2	49	- 4	35.8	22.9	18	23	23	22	74	68	82	74	3.26	.94
A ..	30.010	30.50	29.52	42.1	49.5	42.6	44.7	74	23	53.0	37.1	34	35	36	35	74	62	78	71	2.28	2.07
M .	29.772	30.22	29.31	51.2	57.7	50.4	53.1	77	36	61.1	45.4	44	46	45	45	77	68	83	76	4.07	1.23
J ..	29.836	30.16	29.24	59.9	64.8	57.8	60.8	82	47	68.6	52.7	52	53	52	52	77	69	83	76	1.66	.39
J ..	29,805	30.07	29.51	64.4	71.5	63.7	66.5	94	48	75.1	58.3	58	59	58	59	82	70	84	79	3.63	1.05
A ..	29.830	30.26	29.34	62.0	70.3	61.8	64.7	87	49	73.7	57.1	56	55	56	55	82	60	82	74	3.93	1.54
S ..	29.995	30.40	29.50	55.2	62.9	56.4	58.2	84	39	67.2	50.3	50	50	51	51	84	67	84	78	5.56	1.48
O ..	30.036	30.49	29.50	44.2	53.6	46.0	47.9	78	28	56.2	40.2	39	39	40	39	81	62	79	74	6.70	2.72
N ..	29.814	30.29	29.04	35.8	42.7	37.5	38.7	59	21	45.4	32.1	31	31	32	31	84	68	80	77	5.33	1.53
D ..	29.950	30.59	29.16	21.1	26.6	21.5	23.1	60	- 4	30.1	15.3	17	18	16	17	84	73	79	79	5.04	1.19
Y ..	29.879	30.72	28.64	41.5	48.7	42.2	44.1	94	-12	52.0	36.7	36	37	37	36	80	68	82	77	51.63	....

Monthly and yearly meteorological summaries—Continued.

POPLAR RIVER, MONT.

[H=2,002. T=4. h=1.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.1	6.1	3.1	5.1	3,931	33	W.	W.	14	20	5	2	1	2	23	16	10	8	16	7	0	10	27	31	0	0	1	J.
7.3	7.0	5.0	6.4	5,068	37	NW.	NE.	8	20	10	3	0	2	15	19	7	3	15	10	0	10	14	28	0	0	1	F.
5.7	6.5	3.9	5.4	5,657	42	W.	W.	12	22	6	4	3	8	24	11	3	6	17	8	0	9	9	31	0	0	2	M.
3.0	4.3	2.8	3.4	7,147	36	N.	SE.	15	8	11	25	14	1	11	4	1	15	11	4	0	6	0	15	0	1	4	A.
3.0	5.2	3.5	3.9	6,852	41	W.	W.	17	10	9	12	6	1	20	17	1	11	18	2	0	7	0	5	2	4	7	M.
3.6	6.1	4.3	4.7	5,665	29	NW.	W.	15	6	4	18	11	6	21	9	0	8	18	4	0	5	0	0	7	2	2	J.
1.9	3.2	3.1	2.7	6,446	40	W., SE.	N.	19	14	14	16	6	3	17	4	0	14	17	0	0	5	0	0	16	8	3	J.
3.2	2.1	1.4	2.2	5,967	48	N.	N.	32	14	9	12	9	3	12	2	0	19	11	1	0	7	0	0	15	3	2	A.
4.2	3.8	2.0	3.3	7,196	48	W.	W.	12	3	5	8	12	4	29	15	2	13	16	1	0	4	0	9	0	0	2	S.
4.1	4.9	3.3	4.1	5,047	37	N.	N.	24	10	7	10	7	7	23	4	1	13	13	5	0	4	1	17	0	0	9	O.
4.9	5.3	2.9	4.4	5,615	46	N.	W.	22	8	3	1	2	0	46	7	1	11	13	6	0	7	7	30	0	0	5	N.
5.1	5.3	4.1	4.8	4,347	42	W.	W.	24	8	12	5	2	0	34	6	2	7	18	6	0	11	25	31	0	0	1	D.
4.3	5.0	3.3	4.2	68,938	...	....	W.	214	143	95	116	73	37	275	114	28	128	183	54	0	85	83	197	40	18	39	Y.

PORT ANGELES, WASH.

[H=14. T=20. h=1.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.5	8.4	6.9	7.3	3,252	35	NE.	S.	2	14	7	5	53	6	1	1	4	2	12	17	0	19	6	25	0	0	0	J.
7.2	8.4	6.5	7.4	2,236	29	W.	S.	1	11	6	0	50	2	9	1	4	1	12	15	0	17	0	14	0	0	0	F.
5.6	5.6	5.0	5.4	3,138	24	W.	S.	1	7	9	2	53	2	12	7	0	8	11	12	0	16	0	17	0	0	1	M.
6.4	7.2	6.2	6.6	3,189	28	W.	S.	4	6	6	3	52	1	10	7	1	3	16	11	0	14	0	3	0	0	0	A.
5.0	5.8	6.0	5.6	3,831	20	W.	S.	2	5	8	0	50	4	12	11	1	7	16	8	0	8	0	3	0	0	0	M.
6.0	5.8	4.2	5.3	3,957	22	W.	S.	0	5	2	0	35	14	18	13	3	7	14	9	0	8	0	0	0	0	0	J.
4.0	3.8	5.2	3.7	3,881	21	W.	S.	2	4	7	2	34	12	15	12	5	16	9	6	0	7	0	0	0	2	0	J.
4.0	3.3	3.0	3.4	3,429	20	W.	S.	3	4	6	5	47	9	7	11	1	13	14	4	0	6	0	0	0	0	0	A.
3.5	3.5	2.6	3.2	2,789	16	W.	S.	3	5	10	7	48	3	4	7	3	17	6	7	0	9	0	0	0	0	0	S.
6.0	6.5	4.5	5.7	2,475	15	W.	S.	2	5	13	1	56	5	4	3	4	6	15	10	0	13	0	6	0	0	0	O.
6.4	6.2	5.2	5.9	2,951	25	SW.	S.	2	3	7	1	59	7	5	4	2	4	18	8	0	12	0	19	0	0	0	N.
7.4	7.8	7.1	7.4	2,356	15	N.	S.	3	0	8	9	54	6	5	1	7	1	16	14	1	28	0	6	0	0	0	D.
5.7	6.0	5.0	5.6	37,484	...	....	S.	25	69	89	35	591	71	102	78	35	85	159	121	1	157	6	93	0	2	1	Y.

PORT HURON, MICH.

[H=639. T=70. h=66.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
8.1	8.4	7.3	7.9	7,287	36	NE.	W.	3	10	3	12	15	11	18	17	4	2	8	21	0	21	24	29	0	0	0	J.
6.9	7.5	5.8	6.7	8,252	36	SW., NW	S.	6	7	2	9	28	10	9	13	0	3	13	12	0	13	14	23	0	0	0	F.
5.7	6.9	5.2	5.9	7,902	34	W.	NE.	12	22	3	4	17	10	8	17	0	7	14	10	0	15	9	24	0	2	0	M.
4.6	6.4	3.5	4.8	6,840	44	N.	NE.	15	28	9	11	14	6	4	2	1	11	12	7	1	10	5	11	0	2	0	A.
5.3	5.2	3.8	4.8	6,117	28	SW.	S.	20	23	3	2	25	9	5	5	1	8	18	5	0	10	0	0	0	6	0	M.
3.8	4.6	3.8	4.1	5,325	26	N.	NE.	13	29	5	5	22	3	7	6	0	13	11	6	0	12	0	0	0	4	1	J.
3.1	3.8	3.4	3.4	5,132	28	SE.	NE.	18	34	1	4	13	14	2	4	3	16	9	6	0	11	0	0	1	5	0	J.
4.5	5.0	3.4	4.3	4,404	26	SW., S.	NE.	14	30	2	4	29	3	7	4	0	14	11	6	0	11	0	0	0	1	0	A.
4.6	6.2	4.4	5.1	5,737	40	SW.	S.	1	8	4	8	31	19	11	8	0	8	15	7	0	12	0	0	0	2	0	S.
5.1	5.4	3.9	4.8	6,426	50	SW.	S.	6	11	5	8	29	10	15	8	1	10	11	10	0	9	0	1	0	1	0	O.
6.8	7.3	5.8	6.6	10,188	44	SW.	SW.	0	4	6	10	5	31	22	12	0	5	13	12	0	11	5	21	0	0	1	N.
5.7	6.8	4.8	5.8	8,331	38	W.	S.	3	4	9	6	25	17	17	12	0	4	19	8	0	14	24	28	0	0	0	D.
5.4	6.1	4.6	5.4	82,941	...	....	S.	111	210	52	83	253	143	125	108	10	101	154	110	1	149	81	137	1	23	2	Y.

PORTLAND, ME.

[H=99. T=82. h=71.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.9	6.1	6.1	6.4	6,188	40	NE.	N, NW.	25	11	0	4	3	8	16	25	1	5	14	12	0	17	18	26	0	0	0	J.
5.6	5.9	4.0	5.2	6,972	40	NW.	NW.	8	8	2	3	3	18	16	22	4	8	13	7	1	9	14	25	0	0	0	F.
6.2	5.7	5.9	5.9	6,553	32	NE.	NW.	11	7	10	5	6	11	13	28	2	5	14	12	1	17	7	26	0	1	0	M.
4.7	4.5	5.0	4.7	5,382	36	NE.	SW.	10	12	7	6	16	19	10	8	2	11	12	7	0	5	0	9	0	0	2	A.
5.1	5.0	5.9	5.3	5,557	26	NW.	S.	6	9	10	12	21	11	10	13	1	7	14	10	1	13	0	0	0	4	0	M.
5.0	6.3	4.6	5.3	5,123	22	S.	S.	4	5	11	10	22	13	12	10	3	9	11	10	0	11	0	0	0	1	3	J.
4.5	5.2	3.2	4.3	4,406	24	S.	S.	7	6	4	12	18	15	17	9	5	9	18	4	2	9	0	0	2	1	1	J.
3.5	3.3	3.6	3.5	4,561	22	S.	NW.	2	3	5	12	16	14	15	21	5	13	15	3	0	9	0	0	0	2	1	A.
4.2	6.0	4.8	5.0	5,260	28	SW.	NW.	7	5	7	8	13	16	12	18	4	12	10	8	0	15	0	0	0	1	0	S.
5.6	4.6	3.8	4.7	5,781	31	S.	N.	24	6	2	4	13	17	11	10	6	11	12	8	0	10	0	1	0	1	1	O.
5.8	6.9	5.0	5.9	6,171	44	S.	SW.	9	4	1	3	11	24	22	11	5	7	10	13	0	13	0	16	0	0	1	N.
6.6	5.5	5.5	5.9	6,620	28	NW.	N.	26	4	1	1	2	18	19	17	5	7	13	11	0	14	14	30	0	1	0	D.
5.3	5.4	4.8	5.2	68,574	...	....	NW	139	80	60	80	144	184	173	192	43	104	156	105	5	142	53	133	2	12	9	Y.

Monthly and yearly meteorological summaries—Continued.

PORTLAND, OREGON.

[Latitude, 45° 32′ N.; longitude, 122° 43′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ...	29.930	30.47	29.21	34.1	37.8	36.3	36.1	60	15	43.3	31.7	32	33	32	32	90	82	84	86	9.33	1.45
F ...	30.054	30.52	29.57	41.2	47.6	45.2	44.7	65	31	53.4	39.1	40	42	41	41	96	80	87	88	1.96	.41
M ..	29.976	30.43	29.67	38.9	49.3	46.2	44.8	79	36	54.3	37.5	37	37	39	38	91	64	77	77	5.39	1.05
A ...	29.897	30.38	29.45	43.7	55.0	51.0	49.9	74	36	59.9	42.6	40	39	40	40	88	58	69	72	3.16	1.11
M ..	29.948	30.26	29.63	49.6	63.1	60.5	57.7	89	36	69.9	48.5	46	44	47	46	87	52	63	68	1.32	.26
J ...	29.951	30.17	29.69	54.6	69.0	65.0	62.9	95	46	75.5	53.5	51	50	52	51	87	52	64	67	.67	.23
J ..	29.893	30.08	29.66	57.9	73.1	71.2	67.4	94	50	81.2	56.4	54	54	57	55	86	52	61	66	.32	.13
A ...	29.873	30.09	29.67	57.7	72.8	70.0	66.8	90	48	79.8	55.3	54	54	56	55	87	54	63	68	.03	.02
S ...	29.930	30.19	29.72	55.2	68.0	63.7	62.3	93	43	74.6	52.2	50	52	52	51	85	59	68	71	1.19	.53
O ...	29.986	30.27	29.63	46.6	56.3	51.3	51.4	76	34	60.2	44.4	44	46	47	46	93	69	85	82	2.87	.85
N ...	30.151	30.58	29.42	38.2	44.1	42.4	41.6	58	26	48.8	34.6	36	36	37	36	91	77	84	84	1.00	.32
D ...	29.943	30.34	29.60	43.7	47.1	45.7	45.5	65	30	50.8	40.2	41	43	43	42	92	86	91	89	11.52	1.46
Y ...	29.961	30.58	29.21	46.8	56.9	54.0	52.6	95	15	62.6	44.7	44	44	45	44	89	65	75	76	38.76	....

PRESCOTT, ARIZ.

[Latitude, 34° 33′ N.; longitude, 112° 28′ W.]

J ...	24.711	24.96	24.31	28.7	43.0	34.5	35.4	60	8	46.4	26.4	26	30	29	29	91	64	82	79	5.99	3.90
F ...	24.762	25.06	24.37	31.1	54.4	40.6	42.0	70	19	58.4	29.0	26	27	29	27	81	38	66	62	1.15	.67
M ..	24.662	24.92	24.33	29.6	48.1	38.3	38.7	70	12	51.8	27.1	26	29	29	28	86	51	73	70	3.04	2.18
A ...	24.629	24.83	24.28	36.3	57.7	46.2	46.7	71	27	61.4	34.4	31	32	34	32	82	42	65	63	1.18	.39
M ..	24.768	24.90	24.62	47.0	76.8	61.9	61.9	92	33	79.9	45.6	32	33	34	33	58	21	37	39	.03	.03
J ...	24.731	24.87	24.49	51.3	83.2	67.8	67.4	93	42	85.9	49.6	34	40	40	38	53	23	37	38	.00	.00
J ...	24.774	24.91	24.62	61.0	86.7	74.4	74.0	96	51	90.3	59.7	47	48	51	49	62	28	46	45	.61	.31
A ...	24.786	24.91	24.66	62.7	80.1	70.8	71.2	93	55	83.9	61.6	56	59	59	58	81	51	68	67	4.41	1.32
S ...	24.761	24.88	24.62	52.4	77.1	63.5	64.3	86	43	80.3	50.4	42	44	45	44	70	32	53	52	.46	.26
O ...	24.761	24.98	24.50	40.2	64.3	49.2	51.2	77	26	67.3	37.9	32	34	35	34	74	34	59	56	.23	.15
N ...	24.781	25.05	24.27	25.2	49.5	33.7	36.1	71	−2	53.1	22.1	17	20	21	19	72	35	61	56	1.68	1.59
D ...	24.818	25.02	24.54	30.3	53.6	37.5	40.5	64	22	57.0	28.6	26	30	30	28	83	40	74	66	(*)	(*)
Y ...	24.745	25.06	24.27	41.3	64.5	51.5	52.4	96	−2	68.0	39.4	33	35	36	35	74	38	60	58	18.78	....

RIO GRANDE CITY, TEX.

[Latitude, 26° 23′ N.; longitude, 98° 48′ W.]

J ...	29.907	30.45	29.44	43.9	61.6	51.5	52.3	83	21	62.4	42.7	36	42	40	39	77	52	67	65	1.07	.77
F ...	29.906	30.37	29.45	52.3	72.0	61.1	61.8	88	35	73.9	51.7	44	45	47	45	76	44	62	61	1.72	1.38
M ..	29.776	30.11	29.42	61.4	77.1	66.9	68.5	89	46	79.4	60.1	56	56	56	56	82	51	72	68	1.51	.86
A ...	29.725	30.14	29.41	67.8	85.9	72.9	75.5	102	48	87.1	66.8	62	60	64	62	83	45	74	67	.10	.07
M ..	29.750	30.00	29.49	70.6	92.9	77.4	80.3	103	60	95.1	70.2	66	62	65	64	85	38	67	63	1.58	1.32
J ...	29.683	29.86	29.50	75.8	94.9	81.2	84.0	106	70	97.3	75.4	73	68	73	71	91	44	76	70	2.08	1.09
J ...	29.719	29.86	29.50	75.7	94.3	82.6	84.2	104	72	97.8	75.6	72	68	72	71	88	44	71	68	1.55	1.03
A ...	29.725	29.90	29.51	76.3	96.7	83.7	85.6	104	73	99.5	76.2	72	66	71	70	87	39	66	64	.63	.25
S ...	29.753	29.97	29.55	74.4	86.6	77.5	79.5	98	63	89.9	73.7	73	71	72	72	95	63	85	81	8.21	2.73
O ...	29.906	30.20	29.61	65.3	83.9	72.4	73.9	94	47	86.2	64.5	62	62	64	63	90	48	75	71	.13	.13
N ...	29.919	30.38	29.48	59.3	76.5	66.0	67.3	91	30	77.1	54.7	53	57	56	56	88	58	78	75	1.45	1.00
D ...	29.943	30.44	29.58	51.6	71.5	60.3	61.1	87	25	75.6	48.6	46	45	48	46	81	43	66	63	.08	.08
Y ...	29.809	30.45	29.41	64.5	82.8	71.1	72.8	106	21	85.1	63.4	60	59	61	60	85	48	72	68	22.11	....

ROCHESTER, N. Y.

[Latitude, 43° 8′ N.; longitude, 47° 42′ W.]

J ...	29.342	30.02	28.44	19.8	23.1	19.9	20.9	57	−3	28.9	15.0	17	20	18	18	88	88	93	90	2.58	.67
F ...	29.357	29.85	28.60	20.9	25.8	22.7	23.1	56	−6	32.1	16.0	18	21	19	19	87	82	86	85	2.18	.81
M ..	29.251	29.80	28.56	29.7	34.4	30.3	31.5	67	1	39.0	25.3	26	28	25	26	86	77	81	82	2.85	.79
A ...	29.437	29.78	28.86	43.3	52.1	45.9	47.1	79	24	57.5	39.5	40	42	38	40	86	70	73	76	4.05	1.80
M ..	29.259	29.63	28.88	51.3	59.8	53.3	54.8	82	36	65.1	46.2	46	47	45	46	83	65	74	74	2.98	.76
J ...	29.301	29.56	28.83	59.3	70.0	62.1	63.8	89	42	75.0	53.8	54	57	54	55	84	65	77	75	2.33	1.56
J ...	29.291	29.58	29.06	62.1	74.6	67.0	67.9	91	47	79.1	58.0	58	61	59	59	86	64	76	75	1.07	.25
A ...	29.317	29.61	29.01	61.9	73.3	65.1	66.8	91	47	79.2	58.2	58	62	59	60	86	69	80	79	7.26	3.34
S ...	29.420	29.77	28.92	56.9	67.7	59.2	61.3	90	42	72.3	52.9	52	54	54	54	85	65	83	78	2.90	.83
O ...	29.493	29.83	28.85	46.2	55.8	48.5	50.2	77	28	59.4	42.6	42	46	45	44	85	72	89	82	2.30	.70
N ...	29.291	29.78	28.64	34.2	39.7	34.8	36.2	70	21	44.6	30.4	30	32	30	30	84	75	84	81	4.45	1.15
D ...	29.419	29.95	28.66	20.4	25.0	22.1	22.5	48	−4	29.7	16.0	17	20	18	18	88	81	84	84	1.89	.58
Y ...	29.348	30.02	28.44	42.2	50.1	44.2	45.5	91	−6	55.2	37.8	38	41	39	39	86	73	82	80	36.84	....

* Inappreciable.

Monthly and yearly meteorological summaries—Continued.

PORTLAND, OREGON.

[$H = 80.$ $T = 84.$ $h = 76.$]

Cloudiness (in tenths). 7 a.m.	3 p.m.	11 p.m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.3	7.8	7.2	7.1	3,620	22	S.	S.	7	6	17	5	31	4	2	10	11	4	10	17	0	21	5	14	0	0	0	J.
6.1	7.9	5.9	6.6	3,119	21	S.	S.	7	0	2	8	27	2	3	18	17	4	12	12	0	12	0	1	0	0	0	F.
4.0	5.9	4.2	4.7	4,143	23	S.	S.	8	0	2	3	40	1	3	17	19	12	10	9	0	14	0	2	0	0	0	M.
6.2	7.4	4.7	6.1	4,018	31	S.	S.	3	4	1	10	29	4	2	27	10	6	12	12	0	15	0	0	0	1	0	A.
5.9	6.0	5.6	5.8	4,130	21	S.	NW.	8	0	0	8	26	2	2	36	11	9	8	14	0	10	0	0	0	1	0	M.
4.9	6.0	4.6	5.2	3,548	22	S.	NW.	8	1	1	18	11	4	1	38	8	9	11	10	0	7	0	0	1	0	0	J.
4.7	4.0	3.2	4.0	3,889	17	SE.	NW.	15	0	0	8	13	3	0	39	15	17	4	10	0	5	0	0	4	0	0	J.
2.4	2.3	2.5	2.4	3,699	20	S.	NW.	4	0	1	6	18	2	1	47	14	22	4	5	0	2	0	0	0	0	0	A.
3.0	3.9	2.4	3.1	4,011	24	E.	NW.	0	6	3	5	21	6	2	39	8	16	8	6	0	7	0	0	1	0	0	S.
5.1	6.9	4.6	5.5	3,097	21	S.	S.	5	2	1	15	25	7	0	23	15	9	13	9	0	14	0	0	0	0	0	O.
4.2	5.8	4.8	4.9	2,685	22	S.	NW.	5	3	4	15	20	4	0	23	16	8	14	8	1	9	0	10	0	0	0	N.
7.6	8.4	6.6	7.5	3,995	24	S.	S.	5	2	3	14	45	1	1	18	4	1	12	18	0	24	0	2	0	0	0	D.
5.0	6.0	4.7	5.2	43,954	..	....	NW.	75	24	35	115	306	40	17	335	148	117	118	130	1	140	5	29	6	2	0	Y.

PRESCOTT, ARIZ.

[$H = 5{,}389.$ $T = 7.$ $h = 3.$]

7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.9	4.6	4.0	4.2	5,238	44	SW.	SW.	10	15	2	0	2	28	7	2	27	15	8	8	0	11	2	19	0	0	0	J.
.9	2.5	2.6	2.0	3,950	38	SW.	SW.	13	13	2	5	1	15	13	6	16	20	7	1	0	5	0	20	0	1	0	F.
2.1	3.2	2.2	2.5	5,248	36	SW.	SW.	9	13	1	2	5	31	10	4	18	19	11	1	0	7	0	23	0	0	0	M.
1.2	2.4	1.7	1.8	6,027	32	SW.	SW.	8	5	4	1	6	42	5	6	13	22	7	1	0	8	0	10	0	3	0	A.
1.9	3.3	2.0	2.4	5,942	37	SW.	SW.	2	2	1	3	5	39	6	1	34	20	10	1	0	2	0	0	4	0	0	M.
.6	1.0	.7	.8	4,971	29	SW.	SW.	1	3	0	1	2	65	2	1	15	26	4	0	0	0	0	0	7	1	0	J.
3.4	4.5	2.4	3.4	4,538	29	SW.	SW.	1	1	3	5	6	57	6	3	11	14	15	2	0	6	0	0	21	9	0	J.
3.7	6.1	3.5	4.4	3,829	24	SE., S.	SW.	3	5	3	5	3	43	10	5	16	8	20	3	0	16	0	0	5	22	0	A.
1.1	2.1	.5	1.2	3,576	26	SW.	SW.	1	7	2	8	4	39	7	5	17	26	4	0	0	3	0	0	0	4	0	S.
1.5	2.5	1.5	1.8	4,951	36	SW.	SW.	6	5	5	4	14	41	2	1	15	22	8	1	0	4	0	9	0	1	0	O.
1.0	1.6	1.9	1.5	3,876	40	SW.	SW.	11	9	5	1	3	24	4	3	30	25	4	1	0	2	0	27	0	0	0	N.
1.4	3.5	1.3	2.1	2,200	24	SW.	SW.	11	14	0	0	1	18	10	3	36	21	9	1	0	0	0	22	0	0	0	D.
1.9	3.1	2.0	2.3	54,346	..	....	SW.	76	92	28	35	52	442	82	40	248	238	107	20	0	64	2	130	37	41	0	Y.

RIO GRANDE CITY, TEX.

[$H = 230.$ $T = 16.$ $h = 2.$]

7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.8	3.7	3.6	4.0	3,518	19	N.	N.	30	3	7	10	3	1	4	12	23	14	8	9	0	4	0	5	0	0	0	J.
4.6	4.6	3.4	4.2	3,278	21	SE.	N.	26	9	1	17	6	2	2	9	12	13	7	8	0	4	0	0	0	0	0	F.
6.8	4.3	3.7	4.9	4,596	20	SE.	SE.	23	12	13	27	3	3	0	1	11	9	11	11	0	6	0	0	0	0	0	M.
6.5	5.3	3.9	5.2	5,842	21	SE.	SE.	13	4	29	36	3	1	1	1	2	7	16	7	0	3	0	0	11	1	0	A.
4.4	2.2	1.1	2.6	5,424	18	SE.	SE.	6	5	28	45	0	1	1	2	5	20	9	2	0	3	0	0	26	0	0	M.
4.8	5.9	3.9	4.9	3,853	18	SE.	SE.	12	7	16	37	7	0	2	1	8	8	17	5	0	9	0	0	26	0	0	J.
3.0	4.4	1.5	3.0	4,848	21	SE., N.	SE.	5	8	29	39	4	1	0	0	7	21	9	1	0	4	0	0	30	1	0	J.
2.9	4.6	.7	2.7	4,908	19	SE.	SE.	15	6	16	42	3	0	0	4	7	18	12	1	0	5	0	0	30	0	0	A.
7.3	7.1	4.4	6.3	3,749	15	S.	SE.	26	10	7	27	2	0	2	8	8	4	15	11	0	16	0	0	20	0	0	S.
3.5	2.1	.8	2.1	2,418	14	SE.	SE.	23	3	13	26	6	2	0	5	15	22	7	2	0	1	0	0	7	0	0	O.
4.8	4.2	3.1	4.0	4,222	21	NW.	SE.	29	4	4	31	3	3	1	7	8	14	10	6	0	5	0	1	1	0	0	N
2.2	2.6	.9	1.9	2,950	20	S, N.	N.	23	7	7	17	12	0	1	5	21	22	8	1	0	1	0	2	0	0	0	D
4.6	4.2	2.6	3.8	49,606	..	....	SE.	231	78	170	354	52	14	14	55	127	172	129	64	0	61	0	8	151	2	0	Y.

ROCHESTER, N. Y.

[$H = 621.$ $T = 149.$ $h = 146.$]

7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
8.6	9.6	8.4	8.9	9,724	60	W.	W.	4	5	9	13	11	11	29	9	2	0	6	25	0	21	19	29	0	0	0	J.
8.0	9.0	7.1	8.0	9,138	54	W.	SW.	3	3	3	11	11	21	17	13	2	2	7	19	0	19	13	22	0	0	0	F.
8.4	8.5	6.2	7.7	9,100	40	NW., W	NW.	5	10	9	7	8	13	20	21	0	4	8	19	0	18	8	23	0	1	0	M.
6.1	7.1	4.8	6.0	7,455	36	W.	NE.	9	17	13	5	8	16	9	7	6	4	16	10	0	14	0	9	0	0	0	A.
5.4	7.2	3.1	5.2	7,514	32	NW.	SW.	14	6	3	9	6	22	18	13	2	8	16	7	0	7	0	0	0	2	1	M.
4.7	6.5	4.4	5.2	6,165	32	NW.	SW.	8	12	4	5	8	26	14	11	2	8	14	8	0	10	0	0	0	0	0	J.
5.4	6.1	3.6	5.0	5,445	28	W.	SW.	17	5	3	7	1	24	20	12	4	9	14	8	0	9	0	0	2	2	1	J.
4.1	6.1	4.3	4.8	6,547	34	W.	SW.	14	7	0	6	14	22	16	12	2	9	15	7	0	8	0	0	2	4	0	A.
4.5	6.7	4.8	5.3	7,170	34	NW.	SW.	2	8	4	12	8	28	15	13	0	6	14	10	0	13	0	0	0	4	0	S.
5.9	7.1	4.7	5.9	8,461	44	S.	SW.	9	7	8	6	5	24	28	16	0	8	10	13	0	16	0	2	0	1	0	O.
7.9	8.6	6.5	7.7	10,283	48	W.	W.	4	2	5	3	11	23	33	9	0	2	10	18	0	17	3	23	0	1	0	N.
9.1	8.5	7.1	8.2	8,933	40	W.	SW.	2	4	8	7	8	29	25	10	0	0	10	21	0	15	18	28	0	0	0	D.
6.5	7.6	5.4	6.5	95,935	..	....	SW.	91	86	69	91	99	259	234	146	20	60	140	165	0	167	61	136	4	15	2	Y.

Monthly and yearly meteorological summaries—Continued.

ROSEBURG, OREGON.

[Latitude, 43° 13′ N.; longitude, 123° 20′ W.]

Months and year.	Pressure.			Temperature.								Dew-point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.460	29.92	28.55	39.0	43.2	41.3	41.2	62	23	48.9	36.0	37	36	38	37	92	77	88	86	7.59	1.48
F ..	29.591	30.00	29.07	41.9	48.0	46.2	45.4	72	31	54.8	39.9	40	40	42	41	94	76	86	85	2.44	.71
M .	29.522	29.94	29.17	38.5	50.0	46.9	45.1	74	28	55.9	36.5	35	34	38	36	88	56	72	72	3.03	.95
A ..	29.436	29.88	29.02	42.3	54.8	51.4	49.5	73	33	61.1	40.1	38	37	38	38	86	53	64	68	4.98	1.14
M .	29.491	29.77	29.17	47.2	63.6	59.4	56.7	89	30	71.0	45.8	44	43	44	44	88	48	58	65	1.11	.48
J .	29.510	29.71	29.30	50.8	69.3	64.4	61.5	87	44	75.9	48.8	47	47	48	47	86	46	55	62	.13	.07
J ..	29.440	29.64	29.21	56.8	73.8	71.7	67.4	100	44	82.3	54.4	52	51	52	52	86	47	51	61	2.20	1.27
A ..	29.425	29.58	29.27	55.0	73.2	70.5	66.2	94	46	81.8	52.3	50	51	52	51	84	48	52	61	(*)	(*)
S ..	29.479	29.66	29.30	51.0	68.5	64.8	61.4	95	35	77.1	46.9	47	48	48	48	86	50	57	65	.33	.15
O ..	29.550	29.81	29.19	45.1	56.1	50.8	50.7	82	33	61.9	42.9	44	46	46	45	95	69	83	83	3.43	.72
N ..	29.693	30.10	29.05	36.7	45.1	40.8	40.9	63	22	52.4	33.7	36	38	38	37	96	78	90	88	2.63	.73
D ..	29.534	29.88	29.14	43.6	49.7	47.6	47.0	66	31	54.9	40.7	41	44	44	43	92	81	88	87	7.30	1.64
Y ..	29.511	30.10	28.55	45.7	57.9	54.6	52.7	100	22	64.8	43.2	43	43	44	43	90	61	70	74	35.17	.....

SACRAMENTO, CAL.

[Latitude, 38° 35′ N.; longitude, 121° 30′ W.]

J ..	30.036	30.35	29.27	42.9	47.5	46.8	45.7	62	27	52.0	40.4	41	43	44	43	94	85	90	90	7.95	2.58
F ..	30.032	30.33	29.63	49.3	55.4	55.3	53.3	73	38	61.4	47.1	47	47	48	47	91	75	78	82	.29	.20
M .	29.988	30.30	29.58	46.3	56.3	53.7	52.1	72	38	60.8	44.2	41	41	44	42	83	59	70	71	2.68	1.15
A ..	29.899	30.19	29.58	49.6	60.2	56.7	55.5	80	39	65.4	48.1	46	47	49	47	88	63	77	76	4.08	1.15
M .	29.946	30.14	29.73	53.5	68.4	64.0	62.0	94	44	75.4	52.2	49	51	53	51	86	55	67	69	.07	.06
J ..	29.820	30.01	29.61	58.2	77.7	71.0	69.0	98	51	85.3	57.0	51	55	54	54	78	46	56	60	.00	.00
J ..	29.792	30.00	29.62	60.4	81.5	74.2	72.0	105	52	89.7	58.9	53	59	57	56	78	47	56	60	.00	.00
A ..	29.782	29.92	29.65	60.2	81.5	73.2	71.6	102	53	90.4	58.4	52	58	54	55	74	46	53	58	.00	.00
S ..	29.820	29.99	29.72	57.2	77.0	69.4	67.9	96	49	86.0	55.0	49	54	52	52	76	46	55	59	.00	.00
O ..	29.973	30.23	29.75	49.4	65.1	56.9	57.1	85	38	70.9	46.7	45	47	47	46	85	53	70	70	.68	.43
N ..	30.097	30.32	29.53	42.0	57.1	52.1	50.4	74	32	63.0	38.6	36	39	38	38	81	53	61	65	.21	.21
D ..	30.109	30.35	29.81	44.9	53.1	49.7	49.2	65	32	57.6	42.2	42	44	45	44	91	74	84	83	2.21	.84
Y ..	29.941	30.35	29.27	51.2	65.1	60.2	58.8	105	27	71.5	49.1	46	49	49	48	84	58	68	70	18.17	.....

SAINT LOUIS, MO.

[Latitude, 38° 38′ N.; longitude, 90° 12′ W.]

J ..	29.468	29.98	28.95	21.7	27.9	24.7	24.8	60	− 8	35.0	16.2	17	19	18	18	82	70	75	76	3.11	.85
F ..	29.495	30.04	28.89	30.5	39.0	35.9	35.1	64	− 8	45.8	27.4	23	27	27	26	75	64	70	70	1.71	.69
M .	29.372	29.89	28.75	39.5	49.1	44.9	44.5	81	23	53.5	36.8	33	34	35	34	77	60	69	69	3.04	.79
A ..	29.402	29.73	29.03	53.3	65.0	59.1	59.1	84	24	67.2	51.6	47	50	49	49	80	60	71	70	2.10	.60
M .	29.347	29.71	28.90	63.0	76.3	68.9	69.4	90	47	78.2	60.5	57	60	60	59	82	58	74	72	7.84	3.39
J ..	29.362	29.67	29.11	69.2	80.4	73.0	74.2	91	57	82.3	67.1	63	63	65	63	81	57	76	71	7.09	3.80
J ..	29.357	29.56	29.13	73.6	86.7	80.8	80.4	96	63	89.1	72.1	67	66	69	67	79	51	68	66	.55	.41
A ..	29.366	29.55	29.14	73.9	86.0	79.8	79.9	102	61	88.5	70.4	64	62	64	64	73	47	59	60	2.44	.88
S ..	29.451	29.69	29.15	66.9	77.6	71.8	72.1	91	47	80.4	64.0	57	57	57	57	71	51	62	61	9.60	2.62
O ..	29.576	29.88	28.93	55.0	68.6	61.8	61.8	83	35	70.3	52.4	45	44	46	45	69	44	56	36	.85	.66
N ..	29.443	29.85	28.93	41.5	50.1	45.3	45.6	75	23	54.5	37.8	31	32	33	32	68	53	64	61	3.36	1.42
D ..	29.563	29.95	29.01	26.6	33.7	29.1	29.8	61	− 3	38.5	21.3	18	23	20	20	70	67	70	69	2.65	1.55
Y ..	29.434	30.04	28.75	51.2	61.7	56.3	56.4	102	− 8	65.3	48.1	43	45	45	.44	76	57	68	67	44.34	.....

SAINT PAUL, MINN.

[Latitude, 44° 58′ N.; longitude, 93° 3′ W.]

J ..	29.196	29.60	28.71	0.1	8.6	3.7	4.1	30	−34	12.3	− 4.8	− 2	2	1	(†)	90	76	89	85	1.76	.30
F ..	29.114	29.73	28.53	10.4	20.3	14.3	15.0	49	−28	25.5	4.3	7	11	11	9	86	67	85	79	.25	.10
M .	29.081	29.68	28.53	21.6	33.1	27.8	27.5	58	−10	35.8	19.2	17	20	24	20	83	61	84	76	1.09	.67
A ..	29.074	29.48	28.45	42.6	56.4	48.6	49.2	81	13	59.4	39.9	39	41	42	40	85	59	77	74	3.67	1.48
M .	29.039	29.37	28.69	51.7	68.6	58.3	59.5	84	33	71.4	48.4	46	45	48	46	80	46	71	66	.82	.35
J ..	29.063	29.34	28.77	59.6	74.2	63.9	65.9	91	43	76.9	55.3	55	56	57	56	85	54	80	73	3.63	1.14
J ..	29.069	29.34	28.80	65.4	81.6	71.1	72.7	94	55	83.9	62.5	60	61	63	61	84	50	75	69	1.44	.66
A ..	29.047	29.32	28.82	61.3	79.5	68.1	69.6	94	42	82.3	59.7	57	59	59	58	86	51	73	70	2.27	.97
S ..	29.058	29.36	28.62	52.2	64.3	57.9	58.1	88	33	69.2	48.8	48	48	51	49	87	60	79	75	3.69	1.00
O ..	29.177	29.73	28.59	44.0	62.2	52.6	52.9	82	21	65.2	41.4	39	43	44	42	82	52	73	69	.72	.62
N ..	29.062	29.55	28.27	23.3	33.3	27.1	27.0	74	−3	36.8	19.4	18	20	16	18	80	62	66	69	2.07	.80
D ..	29.235	29.86	28.72	4.8	12.7	7.6	8.4	43	−24	16.5	− 2.0	− 1	5	3	2	76	72	82	77	1.48	.83
Y ..	29.101	29.86	28.27	36.4	49.6	41.8	42.6	94	−34	52.9	32.8	32	34	35	34	84	59	78	74	22.89	.....

* Inappreciable. † Zero.

Monthly and yearly meteorological summaries—Continued.

ROSEBURG, OREGON.

[$H = 523.$ $T = 54.$ $h = 46.$]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.9	8.1	6.3	7.1	1,241	20	SW.	S.	2	8	1	4	16	8	5	5	44	4	12	15	1	20	1	12	0	0	0	J.
5.5	7.0	5.1	5.9	1,030	15	SW.	N.	10	4	4	2	3	6	4	9	42	5	12	11	3	12	0	1	0	0	0	F.
5.7	6.3	4.9	5.6	1,726	14	S., W., NW., SW.	N.	13	6	5	3	7	8	8	10	33	10	9	12	0	13	0	7	0	0	0	M.
5.7	6.2	4.6	5.5	2,114	18	S.	N.	13	5	2	1	11	8	12	10	28	9	12	9	0	13	0	0	0	2	0	A.
5.5	5.5	4.4	5.1	1,673	17	SE.	N., NW.	15	1	4	1	7	8	9	15	33	10	11	10	0	5	0	2	0	1	0	M.
3.7	4.1	4.0	3.9	1,699	13	NW.	NW.	12	2	1	0	0	6	12	28	29	14	12	4	0	2	0	0	0	1	0	J.
4.7	4.3	3.7	4.2	1,947	16	NE.	NW.	14	3	2	1	4	5	6	27	31	12	13	6	0	5	0	0	5	3	0	J.
2.4	2.2	1.8	2.1	2,006	13	NW.	NW.	16	2	1	2	0	8	8	27	29	20	10	1	0	0	0	0	4	0	0	A.
2.3	2.9	1.7	2.3	2,264	18	N.	W.	12	8	5	1	3	9	16	13	23	20	9	1	0	3	0	0	2	0	0	S.
4.9	6.9	5.1	5.6	1,677	16	SW.	NE.	5	15	2	6	7	9	11	9	29	7	13	11	0	19	0	0	0	0	0	O.
4.4	6.1	4.2	4.9	1,735	14	SW.	SW.	8	5	9	2	7	13	12	10	24	9	12	9	0	14	0	11	0	0	0	N.
6.2	7.8	6.5	6.8	2,078	24	SE.	NE.	4	14	10	13	12	12	6	5	17	4	13	14	0	24	0	1	0	0	0	D.
4.8	5.6	4.4	4.9	21,192	....	....	....	124	73	46	36	77	100	109	168	362	124	138	103	4	130	1	34	11	7	0	Y.

SACRAMENTO, CAL.

[$H = 64.$ $T = 61.$ $h = 57.$]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.2	4.3	3.4	3.6	5,366	44	SE.	SE.	2	2	1	28	18	8	0	23	11	14	11	6	4	13	0	4	[illegible]	[illegible]	[illegible]	
1.5	3.7	1.6	2.3	4,065	32	NW.	NW.	2	1	2	14	11	10	2	38	4	17	11	0	0	3	0	[illegible]	[illegible]	[illegible]		
3.3	4.3	3.6	3.7	6,567	37	NW.	NW.	3	4	3	23	9	19	1	27	4	14	12	5	0	12	0	[illegible]	[illegible]			
3.3	4.6	3.7	3.9	5,725	36	NW.	S.	3	0	2	19	21	20	6	16	3	13	12	5	0	12	0	[illegible]	[illegible]			
2.0	2.9	1.5	2.1	5,467	27	NW.	SW.	0	0	0	20	23	38	2	9	1	23	6	2	0	2	[illegible]	[illegible]				
0.0	0.0	0.0	0.0	5,837	42	NW.	S.	2	0	0	19	29	20	3	14	3	30	0	0	0	[illegible]	[illegible]	[illegible]				
0.0	0.3	0.4	0.2	4,850	20	SW.	S.	1	1	0	22	31	30	2	6	0	30	1	0	0	[illegible]	[illegible]	[illegible]				
0.0	0.5	0.1	0.2	4,233	18	SW.	S.	0	0	0	29	35	15	1	11	2	31	0	0	0	[illegible]	[illegible]					
0.0	0.2	0.0	0.1	3,364	26	NW.	S.	2	1	1	17	24	12	0	23	10	30	0	0	0	[illegible]						
1.1	3.0	1.1	1.7	3,583	17	NW.	NW.	7	0	0	19	12	24	3	25	3	22	9	0	0							
1.2	1.9	0.7	1.3	3,6[illegible]5	36	NW.	NW.	17	4	7	16	10	7	2	24	4	26	3	1	[illegible]							
4.3	4.7	4.2	4.4	3,294	25	SE.	SE.	12	2	4	31	8	8	0	20	8	12	11	[illegible]	[illegible]	[illegible]						
1.7	2.5	1.7	2.0	56,036	....	....	SE.	51	15	20	257	231	211	21	236	53	262	76	27	4	[illegible]						

SAINT LOUIS, MO.

[$H = 571.$ $T = 104.$ $h = 99.$]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.2	6.5	5.7	5.8	9,0[illegible]7	44	NW.	NW.	5	8	4	11	17	5	16	27	0	[illegible]	[illegible]									
3.6	5.3	2.9	3.9	8,[illegible]7	41	NW.	S.	11	5	2	6	26	7	6	19	2	[illegible]										
6.6	7.0	5.5	6.4	9,[illegible]21	37	NW., W	S.	12	10	10	7	20	8	8	17	[illegible]	[illegible]										
6.0	6.3	4.0	5.4	8,323	33	NW., S.	SE.	8	13	3	22	15	10	7	[illegible]	[illegible]	[illegible]										
3.9	5.7	2.9	4.2	6,800	44	SW.	N., S.	17	12	7	11	17	13	8	[illegible]	[illegible]											
4.1	6.3	2.7	4.4	6,648	38	SE.	N.	18	9	12	13	14	11	6	[illegible]												
1.9	4.4	1.4	2.6	3,803	28	S.	NE.	10	19	10	14	10	12	10	4	[illegible]											
2.9	5.3	2.4	3.9	6,945	46	SW.	SW.	10	13	8	15	11	20	6	[illegible]	[illegible]											
5.5	5.1	2.2	4.3	7,842	40	SW.	S.	8	5	3	20	26	17	4	7												
3.3	3.5	1.6	2.8	6,230	32	SW.	S.	14	7	3	14	26	11	[illegible]	7												
4.8	6.1	4.8	5.2	8,772	43	SW.	SW.	16	1	7	4	18	14	1[illegible]	[illegible]												
6.2	5.6	4.4	5.4	8,386	36	NW.	N.	27	8	3	6	23	6	[illegible]	[illegible]												
4.6	5.6	3.4	4.5	93,784	....	....	S.	156	110	72	143	22[illegible]	135	[illegible]	[illegible]												

SAINT PAUL, MINN.

[$H = 831.$ $T = 114.$ h [illegible]]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.3	6.9	5.4	5.9	4,623	24	NW.	NW.	3	6	9	[illegible]	2															
5.9	5.4	5.5	5.6	4,791	28	W.	W.	3	[illegible]	7	[illegible]	[illegible]															
6.4	5.9	4.6	5.6	4,322	36	W.	NW.	8	[illegible]	[illegible]	[illegible]	4															
6.4	6.3	5.4	6.0	5,130	28	SE.	SE.	4	[illegible]	[illegible]	[illegible]	[illegible]															
5.2	5.0	2.7	4.3	4,454	28	SW.	NW.	3	[illegible]	[illegible]	[illegible]	[illegible]															
4.3	4.8	2.8	4.0	4,261	37	NW.	NW.	7	[illegible]	[illegible]	[illegible]																
3.7	4.5	2.8	3.7	4,117	22	S.	NW.	11	[illegible]	[illegible]																	
3.7	3.1	3.4	3.4	4,462	31	W.	NW.	[illegible]	[illegible]	[illegible]																	
6.6	5.8	5.7	6.0	5,388	32	W.	E.	1	[illegible]	[illegible]																	
4.6	4.2	3.7	4.2	4,4[illegible]2	29	S.	E.	4	[illegible]	[illegible]																	
5.2	5.0	4.4	4.9	6,106	35	W.	W.	[illegible]	[illegible]																		
4.1	5.1	3.3	4.2	3,979	21	NW.	NW.	[illegible]	[illegible]																		
5.1	5.2	4.1	4.8	56,500	....	....	NW.	[illegible]	[illegible]	[illegible]																	

Monthly and yearly meteorological summaries—Continued.

SAINT VINCENT, MINN.

[Latitude, 48° 56′ N.; longitude, 97° 14′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.342	29.72	28.74	-14.1	- 6.6	-12.8	-11.2	26	-41	- 1.1	-21.2	-15	-15	-15	-15	94	66	91	84	.49	.09
F ..	29.195	29.80	28.57	- 0.8	9.5	6.0	4.9	49	-36	17.4	- 6.3	- 3	1	3	(*)	91	67	87	82	.46	.12
M .	29.154	29.70	28.59	11.8	23.7	17.5	17.7	44	-13	28.4	6.8	9	19	14	14	87	81	87	85	.29	.08
A ..	29.110	29.56	28.53	35.4	52.3	42.7	43.5	82	- 1	55.7	32.7	32	42	38	37	88	69	84	80	2.09	.63
M .	29.055	29.37	28.59	47.0	64.8	52.8	54.9	83	22	68.8	40.3	42	51	46	46	83	62	79	74	1.53	1.06
J ..	29.095	29.38	28.71	55.1	72.7	59.6	62.5	87	30	76.0	47.3	52	63	55	57	89	72	85	82	2.15	.72
J ..	29.068	29.41	28.73	61.1	80.5	66.3	69.3	95	44	83.1	55.9	58	68	62	63	91	66	86	81	2.27	.43
A ..	29.054	29.33	28.76	54.4	76.8	61.3	64.2	103	33	79.7	50.9	52	64	57	58	92	66	85	81	.41	18
S ..	29.017	29.44	28.50	41.7	61.0	48.6	50.4	83	24	63.6	38.3	39	53	45	46	91	76	89	85	3.20	1.50
O ..	29.136	29.79	28.66	36.3	56.1	44.8	45.7	81	15	58.1	33.5	33	42	38	38	87	62	79	76	1.36	.73
N ..	29.123	29.57	28.43	13.1	27.5	16.7	19.1	58	-18	30.6	8.2	8	17	11	12	82	66	79	75	.52	.31
D ..	29.281	29.97	28.55	- 5.3	4.8	- 1.6	- 0.7	36	-38	8.6	-10.7	-10	- 1	- 6	- 6	80	77	81	79	.27	.10
Y ..	29.136	29.97	28.43	28.0	43.6	33.5	35.0	103	-41	47.4	23.0	25	34	29	29	68	69	84	80	15.04	.....

SALT LAKE CITY, UTAH.

[Latitude, 40° 46′ N.; longitude, 111° 54′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	25.640	26.04	25.05	26.0	33.6	27.8	29.1	53	- 2	37.3	20.2	20	23	21	21	76	65	76	72	1.91	.37
F ..	25.718	26.04	25.06	34.6	46.1	38.8	39.8	63	20	50.5	31.1	27	32	30	30	73	59	71	68	1.36	.87
M .	25.589	25.89	25.11	31.2	42.1	36.4	36.6	68	18	46.8	28.6	23	28	28	27	72	59	73	68	2.60	.86
A ..	25.515	25.85	25.04	41.9	52.8	47.7	47.5	71	30	58.1	38.6	33	37	38	36	72	58	69	66	4.43	1.33
M	25.626	25.92	25.40	52.2	70.5	62.0	61.6	92	32	74.8	50.1	46	60	54	53	80	71	74	75	.06	.06
J ..	25.596	25.75	25.16	59.7	77.4	68.3	68.5	95	42	81.4	56.4	55	71	62	62	83	81	81	82	1.02	.90
J ..	25.614	25.76	25.42	68.8	87.8	78.2	78.3	99	51	91.1	65.1	64	82	73	73	86	84	84	85	(†)	(†)
A .	25.631	25.74	25.48	68.4	83.8	74.7	75.6	99	55	88.7	63.5	61	73	66	67	80	73	77	77	.59	0.31
S ..	25.654	25.91	25.36	54.4	71.4	61.2	62.3	88	37	75.6	50.1	44	53	47	48	68	55	60	61	1.88	1.84
O ..	25.650	26.00	25.25	46.5	58.7	50.1	51.8	77	29	62.4	41.1	37	39	38	38	70	52	66	63	1.98	1.01
N ..	25.773	26.16	24.88	27.7	36.2	30.0	31.3	60	14	39.7	22.8	22	25	24	24	80	66	78	74	1.79	.73
D ..	25.756	26.17	25.38	33.1	40.9	35.8	36.6	56	19	44.0	28.2	27	29	30	29	80	63	80	75	1.27	.47
Y ..	25.647	26.17	24.88	45.4	58.4	50.9	51.6	99	- 2	62.5	41.3	38	46	42	42	76	66	74	72	18.89	....

SAN ANTONIO, TEX.

[Latitude, 29° 27′ N.; longitude, 98° 28′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	29.280	29.76	28.86	37.8	52.1	42.8	44.2	81	6	56.4	32.1	31	31	31	31	79	51	66	65	.75	.55
F ..	29.286	29.72	28.83	46.4	64.8	54.6	55.3	90	25	68.3	42.3	37	36	38	37	72	42	57	57	3.15	1.79
M .	29.182	29.46	28.83	52.5	67.0	58.0	59.2	82	35	70.0	48.7	46	47	48	47	81	53	72	69	2.39	1.04
A ..	29.148	29.52	28.88	59.3	73.1	65.2	65.9	87	35	76.3	56.5	55	57	56	56	86	59	74	73	2.23	1.76
M .	29.164	29.38	28.98	65.4	84.3	73.9	74.5	95	54	87.1	63.9	61	62	62	62	87	49	69	68	2.61	2.36
J ..	29.097	29.27	28.90	70.6	88.0	77.8	78.8	101	63	91.2	69.2	68	68	68	68	92	52	74	73	3.52	1.77
J ..	29.129	29.29	28.92	73.4	91.0	81.1	81.8	103	66	94.2	71.9	71	69	70	70	92	49	70	70	1.41	.68
A ..	29.132	29.32	27.93	74.4	91.6	82.0	82.7	100	70	94.9	73.0	71	66	69	69	90	45	66	67	4.79	4.54
S ..	29.182	29.38	28.92	72.2	83.7	75.5	77.1	92	54	85.9	70.0	71	70	71	71	96	65	87	82	4.12	1.48
O ..	29.311	29.60	28.98	60.7	77.6	66.8	68.4	91	43	79.7	58.3	59	62	62	61	93	59	84	78	.62	.32
N ..	29.313	29.74	28.85	52.2	66.6	57.4	58.7	84	22	69.4	49.3	47	52	50	50	84	62	77	74	.33	.18
D ..	29.327	29.76	28.98	45.7	61.7	51.0	52.8	79	17	65.1	41.8	40	40	41	40	81	50	71	67	.30	.15
Y ..	29.213	29.76	27.93	59.2	75.1	65.5	66.6	103	6	78.2	56.4	55	55	56	55	86	53	72	70	26.22	....

SAN DIEGO, CAL.

[Latitude, 32° 43′ N.; longitude, 117° 10′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
J ..	29.988	30.25	29.66	51.2	61.6	54.9	55.9	73	35	62.3	49.3	45	47	48	47	80	63	80	74	6.95	1.76
F ..	29.953	30.16	29.73	52.0	66.1	57.5	58.5	80	44	68.0	50.1	46	50	50	48	76	58	78	71	1.51	.69
M .	29.974	30.19	29.66	50.1	60.8	54.2	55.0	68	41	62.2	48.0	46	48	49	48	85	64	83	77	3.73	1.38
A ..	29.931	30.08	29.63	53.2	61.8	56.6	57.2	71	45	63.1	51.8	48	49	51	50	86	65	81	76	1.95	1.20
M .	29.952	30.09	29.84	56.1	65.3	59.9	60.4	72	50	67.4	54.5	52	54	55	51	85	69	83	79	.04	.02
J ..	29.854	29.97	29.70	59.8	67.4	62.1	63.1	75	54	69.5	58.6	56	57	57	57	87	70	85	81	.07	.04
J ..	29.828	29.98	29.71	63.9	71.5	65.9	67.1	81	57	73.4	62.4	60	59	60	60	87	64	82	78	(†)	(†)
A ..	29.818	29.96	29.69	66.9	75.0	69.5	70.5	82	61	77.5	65.5	63	63	64	63	87	67	83	79	(†)	(†)
S ..	29.836	29.97	29.76	64.0	70.7	65.0	66.6	78	60	72.3	62.7	61	62	61	61	90	74	88	84	.00	.00
O ..	29.974	30.20	29.86	55.2	65.0	58.9	59.7	75	46	66.6	53.3	51	56	54	54	87	72	86	82	.05	.05
N ..	30.031	30.18	29.70	49.6	64.0	54.5	56.0	77	40	65.8	48.0	41	46	48	45	75	55	79	70	.95	.74
D ..	30.038	30.20	29.90	51.6	61.9	54.4	56.0	75	40	63.4	49.2	48	52	50	50	89	72	86	82	.10	.06
Y ..	29.932	30.25	29.63	56.1	65.9	59.4	60.5	82	35	67.6	54.4	51	54	54	53	84	66	83	78	15.55	....

* Zero. † Inappreciable.

Monthly and yearly meteorological summaries—Continued.

SAINT VINCENT, MINN.

[$H = 804.$ $T = 7.$ $h = 14.$]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3. 7	4. 4	3. 3	3. 8	6, 634	33	S.	NW.	10	1	1	10	14	3	6	40	8	12	15	4	0	12	31	31	0	0	6	J.
3. 5	6. 9	3. 6	4. 7	7, 997	45	NW.	NW.	11	4	5	7	19	4	2	25	7	6	18	4	0	12	22	28	0	0	2	F.
5. 0	6. 3	4. 0	5. 1	7, 627	39	W.	NW.	14	1	3	14	19	6	5	26	5	9	12	10	0	7	18	31	0	0	3	M.
6. 0	5. 6	4. 8	5. 5	8, 162	36	SE ,SW	SE., S.	16	2	3	18	18	6	12	15	0	10	7	13	0	10	2	11	0	2	1	A.
4. 5	5. 0	4. 0	4. 5	7, 211	35	W.	NW.	18	5	3	8	18	9	11	19	2	8	19	4	0	10	0	4	0	1	1	M.
4. 3	5. 2	4. 2	4. 6	5, 169	28	S.	N.	22	3	9	5	16	7	13	13	2	10	12	8	0	9	0	1	0	4	1	J.
3. 6	5. 3	2. 5	3. 8	4, 921	27	S.	N.	30	2	3	8	18	7	8	14	3	13	18	0	0	9	0	0	6	7	1	J.
3. 3	3. 8	1. 6	2. 9	5, 873	39	NW.	N.	34	3	6	5	24	3	6	10	2	17	13	1	0	4	0	0	5	0	0	A.
5. 4	6. 2	3. 2	4. 9	6, 838	39	NW.	NW.	9	1	6	4	17	7	22	24	0	11	12	7	0	8	0	9	0	3	1	S.
4. 8	5. 3	3. 9	4. 7	7, 366	30	S.	S.	24	1	4	4	35	7	6	12	0	11	12	8	0	6	0	10	0	1	3	O.
4. 5	4. 7	3. 8	4. 3	7, 516	46	W.	N.	33	0	0	1	23	1	15	16	1	10	13	7	0	7	15	29	0	0	0	N.
3. 6	5. 2	3. 2	4. 0	4, 347	39	N.	N.	18	1	1	3	14	8	13	15	20	10	18	3	0	5	28	31	0	0	1	D.
4. 4	5. 3	3. 5	4. 4	79, 661	..	....	N.	239	24	44	87	235	68	119	229	50	127	169	69	0	99	116	185	11	18	20	Y.

SALT LAKE CITY, UTAH.

[$H = 4{,}348.$ $T = 92.$ $h = 78.$]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6. 2	5. 9	5. 3	5. 8	3, 520	32	SE.	SE.	4	4	8	30	9	1	7	21	9	8	10	13	0	16	13	23	0	2	0	J.
4. 3	4. 7	4. 0	4. 3	2, 822	21	NW.	SE.	10	6	13	15	14	2	4	13	7	10	11	7	0	9	0	13	0	0	0	F.
4. 7	6. 1	4. 0	4. 9	3, 730	25	S.	NW.	8	5	9	13	13	5	3	27	10	9	13	9	0	13	0	24	0	0	0	M.
6. 5	7. 6	4. 5	6. 2	4, 319	32	NW.	SE.	8	7	14	21	8	6	9	16	1	4	18	8	0	11	0	3	0	0	0	A.
4. 5	4. 2	3. 1	3. 9	4, 534	28	NW.	N., SE.	21	7	8	21	8	0	3	19	5	11	15	4	0	1	0	1	2	1	0	M.
2. 3	3. 0	2. 9	2. 7	4, 146	28	NW.	NW.	17	10	13	11	9	2	4	21	3	17	13	0	0	4	0	0	2	2	0	J.
2. 4	1. 7	3. 8	2. 6	4, 287	28	N.	SE.	14	13	11	23	8	0	3	19	2	16	15	0	0	6	0	0	19	1	0	J.
3. 8	3. 9	3. 5	3. 7	3, 210	26	NW.	S.	17	10	10	15	22	3	5	10	1	14	12	5	0	5	0	0	13	2	0	A.
1. 8	2. 7	0. 9	1. 8	3, 734	22	E., NW.	NW.	15	15	8	14	4	2	8	21	3	22	7	1	0	2	0	0	0	0	0	S.
3. 3	5. 0	2. 3	3. 5	4, 193	28	S.	SE.	9	7	16	23	9	1	5	12	11	16	11	4	0	8	0	2	0	0	0	O.
4. 9	4. 9	4. 4	4. 7	2, 730	28	S.	SE.	4	4	5	29	8	5	6	11	18	13	6	11	0	13	4	27	0	1	0	N.
4. 0	6. 6	5. 0	5. 2	2, 239	28	SW.	SE.	3	8	11	30	13	8	5	6	9	7	17	7	0	12	0	23	0	0	0	D.
4. 1	4. 7	3. 6	4. 1	43, 470	..	....	SE.	130	96	126	245	125	35	62	196	79	147	148	69	0	94	17	116	36	9	0	Y.

SAN ANTONIO, TEX.

[$H = 781.$ $T = 17.$ $h = 2.$]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4. 7	4. 4	4. 0	4. 4	6, 955	31	N.	N.	40	23	2	4	10	7	3	3	1	13	10	8	0	4	3	13	0	0	0	J.
5. 1	5. 1	4. 5	4. 9	5, 791	42	N.	N.	25	18	4	10	9	10	5	3	0	10	9	9	0	6	0	4	0	0	0	F.
7. 4	6. 4	5. 9	6. 6	7, 267	30	N.	N.	27	13	6	19	19	2	2	5	0	8	5	18	0	10	0	0	0	4	0	M.
6. 5	6. 5	5. 6	6. 2	7, 006	28	NE.	SE.	13	10	13	31	16	2	2	0	3	7	9	14	0	8	0	0	0	2	0	A.
6. 7	3. 7	2. 0	4. 1	5, 845	28	N.	SE.	11	14	8	34	22	0	3	0	1	9	16	6	0	3	0	0	13	2	0	M.
5. 2	5. 3	4. 1	4. 9	4, 546	34	NE.	SE.	21	13	13	22	14	0	1	0	6	9	12	9	0	9	0	0	20	4	0	J.
6. 0	5. 9	2. 9	4. 9	4, 898	28	SE.	SE.	8	11	14	35	16	6	0	2	1	8	15	8	0	8	0	0	27	8	0	J.
5. 5	5. 1	2. 2	4. 3	4, 464	60	N.	SE.	10	8	12	45	14	0	1	0	3	7	20	4	0	5	0	0	27	3	0	A.
5. 4	7. 3	3. 7	5. 5	6, 104	24	NE., N.	N.	21	13	17	20	14	1	0	2	2	7	15	8	0	15	0	0	2	4	0	S.
4. 9	4. 0	1. 8	3. 6	5, 566	28	N.	N.	30	14	9	26	9	1	0	0	4	12	15	4	0	4	0	0	1	1	0	O.
6. 2	5. 4	4. 8	5. 5	5, 895	30	N.	N.	23	17	4	15	19	3	3	2	4	11	8	11	0	5	0	2	0	0	0	N.
2. 7	3. 6	2. 6	3. 0	5, 485	34	N.	N.	35	8	3	4	19	3	4	1	16	16	11	3	0	3	0	3	0	1	0	D.
5. 5	5. 2	3. 7	4. 8	69, 822	..	....	SE.	264	162	105	265	181	35	24	18	41	117	145	102	0	80	3	22	90	29	0	Y.

SAN DIEGO, CAL.

[$H = 66.$ $T = 23.$ $h = 42.$]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4. 6	4. 5	4. 5	4. 5	3, 677	29	S.	NW.	15	15	7	6	11	4	14	19	2	12	9	10	0	11	0	0	0	1	0	J.
2. 6	3. 1	2. 5	2. 7	3, 090	20	E., W.	NW.	12	11	9	3	7	5	14	21	2	18	5	5	0	5	0	0	0	0	0	F.
5. 2	3. 2	2. 2	3. 5	4, 011	28	S.	W.	9	9	4	3	6	11	20	17	14	12	18	1	0	9	0	0	0	2	0	M.
5. 7	3. 6	3. 6	4. 3	4, 999	37	S.	NW.	9	4	3	2	5	9	25	33	0	11	13	6	0	6	0	0	0	1	0	A.
5. 5	2. 8	4. 1	4. 1	4, 883	21	NW.	N.	28	3	7	0	2	15	18	20	0	9	19	3	0	0	0	0	0	0	0	M.
8. 7	3. 5	6. 9	6. 4	4, 534	24	SW.	SW.	13	0	1	1	3	38	21	13	0	3	15	12	0	1	0	0	0	0	0	J.
8. 2	1. 1	2. 4	3. 9	4, 205	19	NW.	NW.	24	3	0	0	2	16	23	25	0	4	25	2	0	0	0	0	0	0	0	J.
5. 5	1. 3	2. 0	2. 9	4, 031	19	NW.	NW.	19	0	0	0	0	23	19	32	0	12	17	2	0	0	0	0	0	0	0	A.
9. 3	0. 8	4. 5	4. 9	3, 925	18	NW.	NW.	15	5	1	0	4	16	17	20	12	2	26	2	0	0	0	0	0	0	0	S.
4. 6	3. 1	3. 5	3. 7	4, 047	19	NW.	NW.	17	5	6	1	6	12	9	19	18	11	16	4	0	1	0	0	0	0	0	O.
1. 9	2. 4	1. 7	2. 0	3, 495	32	NW.	NW.	14	9	13	1	1	5	6	20	21	21	7	2	0	3	0	0	0	0	0	N.
3. 5	4. 1	3. 3	3. 6	2, 719	16	N.	N.	16	8	5	2	4	7	4	15	32	15	9	7	0	2	0	0	0	0	0	D.
5. 4	2. 8	3. 4	3. 9	47, 614	..	....	NW.	191	72	56	19	51	161	190	254	101	130	179	56	0	38	0	0	0	4	0	Y.

Monthly and yearly meteorological summaries—Continued.

SANDUSKY, OHIO.

[Latitude 41° 25′ N.; longitude, 82° 40′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J..	29.340	29.95	28.68	20.7	25.2	22.3	22.7	54	-12	29.8	15.3	15	19	17	17	79	78	81	79	2.28	.66
F..	29.388	29.93	28.64	23.4	30.1	26.0	26.5	61	- 8	33.7	17.4	18	21	18	19	79	70	74	74	1.12	.27
M..	29.274	29.76	28.52	31.0	39.1	34.5	34.9	76	7	42.7	27.5	26	29	28	28	81	69	78	76	2.38	.92
A..	29.382	29.72	28.79	45.2	52.3	47.4	48.3	84	21	56.6	40.4	39	40	40	40	80	67	78	75	2.35	1.48
M..	29.278	29.66	28.88	56.0	63.7	58.8	59.5	81	41	68.0	51.7	49	49	49	49	77	61	72	70	3.69	1.23
J..	29.306	29.55	28.97	63.2	71.0	64.6	66.3	87	46	74.6	59.3	55	57	57	56	76	62	77	72	2.16	1.00
J..	29.295	29.51	29.04	67.1	76.1	69.7	71.0	96	56	79.8	63.2	58	60	60	59	74	60	71	68	2.26	1.06
A..	29.322	29.59	29.03	66.4	75.6	68.9	70.3	90	53	79.7	63.5	61	62	61	61	82	64	77	74	3.78	1.00
S..	29.409	29.72	29.01	60.2	71.7	63.9	65.3	88	44	75.3	57.4	55	56	56	56	83	60	76	73	3.83	1.15
O..	29.507	29.80	28.73	48.6	60.5	52.9	54.0	83	35	63.9	46.1	43	47	45	45	82	63	76	74	1.24	.69
N..	29.333	29.71	28.61	35.1	42.0	37.4	38.2	71	20	46.0	31.3	29	31	31	30	78	69	79	75	2.94	1.49
D..	29.448	29.88	28.86	21.1	28.1	24.0	24.4	58	4	31.8	17.4	17	21	21	20	83	76	88	82	2.97	1.17
Y..	29.357	29.95	28.52	44.8	53.0	47.5	48.4	96	-12	56.8	40.9	39	41	40	40	79	67	77	74	31.00	.....

SANDY HOOK, N. J.

[Latitude 40° 28′ N.; longitude 74° W.]

J..	30.034	30.82	28.79	27.2	31.0	28.2	28.8	52	4	34.2	23.3	21	24	23	23	78	77	80	78	4.47	1.63
F..	30.045	30.52	29.24	25.4	32.0	28.8	28.7	53	- 2	37.4	22.5	20	24	24	23	80	77	81	79	6.53	4.33
M..	29.918	30.51	29.31	33.7	41.0	35.7	36.8	60	9	44.4	31.0	28	32	30	30	81	73	79	78	5.27	1.44
A..	30.093	30.54	29.41	45.1	54.0	47.1	48.7	80	31	58.0	42.5	41	43	42	42	87	70	83	80	5.06	3.46
M..	29.900	30.38	29.56	54.1	63.5	56.2	57.9	86	45	66.7	52.0	49	52	51	51	84	69	84	79	8.46	3.30
J..	29.954	30.30	29.50	61.0	70.3	63.4	64.9	82	53	73.3	58.7	57	60	59	59	88	72	86	82	4.00	1.31
J..	29.916	30.22	29.69	69.0	78.5	70.6	72.7	93	61	81.7	66.7	65	68	67	67	89	71	88	83	5.70	1.81
A..	29.947	30.31	29.57	68.2	77.0	70.2	71.8	89	60	79.1	66.0	64	65	64	64	87	68	80	78	2.75	1.94
S..	30.107	30.41	29.68	65.1	73.2	67.5	68.6	87	4	74.8	63.0	60	64	63	62	84	73	86	81	1.06	.54
O..	30.147	30.52	29.77	54.2	61.9	56.0	57.4	79	38	63.8	51.3	49	52	50	50	84	70	81	78	6.70	3.88
N..	30.000	30.45	29.45	43.6	50.4	45.5	46.5	69	29	53.2	40.1	37	39	38	38	77	67	75	73	5.88	1.86
D..	....	.....	.....	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....
Y..	....	.....	.....	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....

SANFORD, FLA.

[Latitude, 28° 48′ N.; longitude, 81° 23′ W.]

J..	30.045	30.45	29.65	48.6	59.9	50.9	53.1	77	21	62.4	45.2	44	46	46	45	85	61	83	77	4.77	2.68
F..	30.113	30.52	29.81	52.3	65.6	54.2	57.4	79	31	67.7	48.5	48	50	49	49	87	60	82	76	1.18	.39
M..	30.031	30.39	29.64	58.2	68.7	59.6	62.2	86	42	70.9	54.7	54	53	53	53	86	61	80	76	8.17	2.26
A..	30.017	30.27	29.68	61.9	72.9	63.5	66.1	86	44	74.9	59.0	57	54	58	56	84	54	83	74	6.60	2.88
M..	30.004	30.19	29.82	69.9	82.8	70.6	74.4	93	58	85.2	65.4	65	61	64	64	86	50	80	72	.89	.47
J..	29.941	30.12	29.81	76.9	85.7	75.4	79.3	95	65	89.2	71.3	73	71	72	72	88	63	90	81	11.08	2.48
J..	29.960	30.13	29.68	76.7	82.2	75.4	78.1	93	67	88.0	72.2	73	72	73	73	90	73	92	85	10.21	1.87
A..	29.955	30.16	29.74	77.1	84.8	77.0	79.6	94	68	88.7	73.1	74	72	73	73	90	66	88	81	4.12	1.34
S..	29.999	30.12	29.83	76.4	84.7	76.9	79.3	92	65	87.0	73.7	73	71	73	72	89	64	87	80	5.01	1.61
O..	30.044	30.19	29.88	70.0	77.0	70.7	72.6	86	56	78.9	67.6	66	65	66	66	86	68	85	80	8.75	3.28
N..	30.119	30.33	29.93	58.5	72.3	61.0	63.9	82	42	73.8	54.7	53	54	54	54	83	54	78	72	.79	.65
D..	30.099	30.35	29.78	52.1	65.5	56.1	57.9	78	33	67.3	49.2	48	51	51	50	87	62	84	78	3.20	2.18
Y..	30.027	30.52	29.64	64.9	75.2	65.9	68.7	95	21	77.8	61.2	61	60	61	60	87	61	84	78	64.77	.....

SAN FRANCISCO, CAL.

[Latitude 37° 48′ N.; longitude 122° 26′ W.]

J..	30.030	30.34	29.26	48.4	53.0	51.2	50.9	67	41	56.5	45.8	44	43	45	44	85	72	80	79	7.42	2.40
F..	30.041	30.30	29.67	52.1	59.5	55.7	55.8	71	41	63.8	49.9	48	47	48	47	86	64	76	75	.24	.18
M..	30.011	30.31	29.61	48.6	57.4	51.7	52.6	73	41	60.7	46.6	42	39	43	41	80	54	72	69	2.07	.63
A..	29.932	30.22	29.53	51.6	59.6	53.4	54.9	79	44	61.7	49.2	45	45	45	45	80	60	74	72	5.28	1.36
M..	29.996	30.18	29.80	53.5	63.7	56.2	57.8	86	48	66.4	51.8	48	48	48	48	82	57	75	72	.37	.21
J..	29.902	30.09	29.68	52.7	65.3	55.6	57.9	83	48	67.8	51.1	49	49	49	49	87	57	79	74	.01	.01
J..	29.875	30.06	29.72	54.7	65.5	57.2	59.1	78	50	67.7	52.9	51	52	52	52	88	62	82	77	.23	.23
A..	29.865	30.03	29.72	53.9	65.2	56.3	58.5	85	48	68.7	52.6	51	53	53	52	92	66	89	82	(*)	(*)
S..	29.883	30.00	29.77	55.0	68.1	58.5	60.5	94	50	71.0	53.8	52	52	52	52	88	58	81	76	.01	.01
O..	30.009	30.24	29.80	52.8	62.7	55.8	57.1	79	46	66.1	51.1	49	49	50	49	87	63	80	77	1.48	.72
N..	30.108	30.31	29.62	50.6	59.2	55.4	55.1	75	45	63.7	49.0	44	42	43	43	81	56	64	67	.84	.77
D..	30.123	30.33	29.86	50.4	55.5	53.4	53.1	66	43	58.9	48.4	47	47	48	48	89	75	83	82	2.07	1.10
Y..	29.981	30.34	29.26	52.0	61.2	55.0	56.1	94	41	64.4	50.2	48	47	48	48	85	62	78	75	20.02	.....

* Inappreciable.

***Monthly and yearly meteorological summaries*—Continued.**

SANDUSKY, OHIO.

[$H=638.$ $T=74.$ $h=66.$]

Cloudiness (in tenths).				Wind.														Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northeast.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.5	8.1	7.2	7.6	10,516	50	NW.	SW.	8	7	8	10	15	19	13	13	0	4	8	19	0	19	16	27	0	0	0	J.
6.9	6.8	5.4	6.4	10,403	51	NW.	SW.	7	4	5	5	9	35	9	10	0	4	13	11	0	11	13	23	0	0	0	F.
5.8	6.0	5.0	5.6	10,064	40	NW.	SW.	10	14	11	2	9	21	14	12	0	6	16	9	0	11	4	21	0	0	0	M.
5.7	5.2	3.9	4.9	9,390	46	N.	E.	12	18	24	5	12	11	6	1	1	9	14	7	0	6	1	9	0	0	0	A.
5.0	4.2	3.8	4.3	7,791	35	NW.	SW.	12	15	11	8	11	22	6	8	0	10	16	5	0	13	0	0	0	6	0	M.
5.4	4.6	3.0	4.3	7,029	35	N.	S.	15	14	9	8	16	13	7	8	0	12	12	6	0	11	0	0	0	3	1	J.
3.5	4.1	3.6	3.7	6,799	36	W.	N., NE.	20	20	12	10	10	13	4	4	0	14	12	5	0	5	0	0	1	4	1	J.
5.5	5.5	4.3	5.1	7,312	36	N.	SW.	11	18	9	6	13	20	5	10	1	10	14	7	0	12	0	0	0	7	0	A.
3.9	4.9	4.2	4.3	7,715	46	NW.	SW.	8	8	5	10	15	23	13	8	0	11	14	5	0	11	0	0	0	2	0	S.
4.5	4.9	4.1	4.5	9,304	53	W.	W.	10	9	7	5	18	17	19	8	0	14	6	11	0	8	0	0	0	1	0	O.
6.3	6.5	6.1	6.3	11,098	47	NE.	SW.	6	6	4	2	14	27	19	12	0	6	11	13	0	8	2	18	0	0	0	N.
5.5	6.3	6.4	6.1	9,189	52	N.	SW.	9	5	10	4	11	27	17	10	0	6	12	13	1	15	16	28	0	0	0	D.
5.5	5.6	4.8	5.3	106,610	..	....	SW.	128	138	115	75	153	248	132	104	2	106	148	111	1	130	52	126	1	23	2	Y.

SANDY HOOK, N. J.

[$H=28.$ $T=16.$ $h=1.$]

4.8	6.4	3.5	4.9	14,649	66	NE.	NW.	14	14	10	4	2	4	21	23	1	10	14	7	0	14	9	20	0	0	0	J.
3.6	5.0	2.8	3.8	14,667	72	NW.	NW.	4	11	4	6	4	21	7	27	0	10	16	2	1	9	7	22	0	0	0	F.
5.3	4.8	3.8	4.6	14,608	60	NW.	NW.	7	4	18	2	2	11	19	30	0	11	14	6	0	14	2	13	0	1	0	M.
5.4	4.2	4.1	4.6	10,769	60	E.	E.	4	4	34	15	3	12	12	6	0	10	14	6	2	14	0	1	0	2	0	A.
5.8	6.2	4.5	5.5	11,601	48	NW.	SW.	4	4	19	7	12	22	15	10	0	11	10	10	0	19	0	0	0	2	0	M.
4.5	5.3	3.9	4.6	9,339	40	E.	E.	10	4	24	10	5	15	13	9	0	13	11	6	0	13	0	0	0	1	0	J.
4.4	4.1	3.2	3.9	8,344	66	NW.	W.	5	3	17	4	15	20	24	5	0	12	15	4	0	8	0	0	2	3	0	J.
4.7	4.3	1.9	3.7	9,441	60	N.	SW.	4	13	11	7	16	18	12	12	0	15	11	5	0	7	0	0	0	0	0	A.
4.7	5.4	3.1	4.4	10,031	40	NW.	S.	7	8	13	16	17	10	8	11	0	8	19	3	0	7	0	0	0	2	0	S.
4.3	5.3	3.9	4.5	12,943	48	NW.	NE.	8	21	10	10	7	10	11	16	0	10	15	6	0	7	0	0	0	0	0	O.
5.0	5.3	4.5	4.9	14,039	60	NE.	W.	3	4	4	2	16	13	35	13	0	10	11	9	0	11	0	4	0	0	0	N.
...	...	...	...	....	..	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	D.
..	...	...	...	....	..	....	....	...	...	...	...	...	...	...	...	..	...	...	...	..	...	..	...	..	..	..	Y.

SANFORD, FLA.

[$H=25.$ $T=46.$ $h=35.$]

5.8	6.3	5.0	5.7	5,118	26	W.	W.	15	6	8	6	4	9	22	17	6	7	13	11	0	11	0	4	0	0	0	J.
4.9	5.2	2.9	4.3	3,997	28	N.	N.	28	12	9	2	5	4	11	9	4	11	12	5	0	5	0	1	0	0	0	F.
6.5	6.6	5.3	6.1	4,980	23	N.	N.	18	11	8	11	15	2	12	15	1	5	16	10	0	17	0	0	0	3	0	M.
3.7	5.2	2.6	3.8	5,827	33	NE.	NE.	14	32	10	7	3	4	13	4	3	15	10	5	0	9	0	0	0	2	0	A.
3.8	4.9	1.4	3.4	3,927	18	NW.	W.	8	13	13	11	4	15	19	9	1	14	14	3	0	4	0	0	4	4	0	M.
3.6	6.8	3.9	4.8	3,894	28	S.	E.	12	12	20	16	14	6	5	2	3	9	18	3	0	18	0	0	11	13	0	J.
5.7	8.4	5.2	6.4	3,649	27	NW.	S.	3	5	5	11	42	11	5	5	6	3	19	9	0	25	0	0	10	6	0	J.
4.1	6.4	2.8	4.4	4,406	26	NE.	NE.	11	23	13	10	13	15	3	0	5	12	12	7	0	15	0	0	13	3	0	A.
3.5	5.7	2.7	4.0	5,446	26	N.	NE.	14	39	18	3	4	3	7	1	1	14	12	4	0	15	0	0	6	3	0	S.
5.4	6.0	4.4	5.3	6,702	32	N.	N.	34	24	19	2	4	0	2	7	1	9	11	11	0	17	0	0	0	1	0	O.
3.4	3.4	1.4	2.7	4,748	23	N.	N.	37	5	9	4	9	6	8	6	6	15	15	0	0	2	0	0	0	1	0	N.
4.6	6.5	4.3	5.1	4,384	22	W.	N.	29	12	10	2	7	9	10	11	3	8	13	10	0	12	0	0	0	0	0	D.
4.5	6.0	3.5	4.7	57,078	..	....	N.	223	194	142	85	124	84	117	86	40	122	165	78	0	150	0	5	44	36	0	Y.

SAN FRANCISCO, CAL.

[$H=60.$ $T=88.$ $h=68.$]

5.7	6.6	4.4	5.6	5,224	42	SE.	N.	29	7	7	12	7	10	8	11	2	10	9	12	4	14	0	0	0	0	0	J.
3.7	3.5	2.5	3.2	4,344	25	NW.	NW.	15	11	2	4	6	5	17	23	1	16	8	4	3	4	0	0	0	0	0	F.
3.7	4.8	3.0	3.8	5,949	31	W.	W.	11	9	1	9	8	14	20	18	3	15	11	5	1	13	0	0	0	0	0	M.
5.5	5.8	4.7	5.3	7,280	26	W.	W.	7	2	1	4	15	21	25	15	0	8	15	7	2	13	0	0	0	0	0	A.
4.8	3.6	3.9	4.1	7,583	31	W.	W.	0	3	0	1	9	33	42	5	0	15	11	5	3	3	0	0	0	0	0	M.
4.0	1.0	2.4	2.5	9,366	34	W.	W.	0	0	1	0	2	36	46	4	1	18	10	2	4	0	0	0	0	0	0	J.
5.2	1.7	3.7	3.5	9,039	32	W.	W.	0	0	0	0	[illegible]	44	45	1	2	14	14	3	7	1	0	0	0	1	0	J.
5.7	2.2	4.9	4.3	8,790	34	W.	W.	0	0	0	1	1	42	47	0	2	11	14	6	11	0	0	0	0	0	0	A.
4.9	1.3	3.7	3.3	6,325	31	W.	W.	3	1	0	3	0	27	51	2	3	14	12	4	0	1	0	0	2	0	0	S.
3.4	4.0	2.5	3.3	5,549	28	W.	W.	2	4	0	8	1	28	33	15	2	16	11	4	0	5	0	0	0	0	0	O.
2.8	2.4	1.6	2.3	4,949	30	N.	N.	26	12	0	8	4	2	17	20	1	20	9	1	0	3	0	0	0	0	0	N.
6.0	6.4	4.3	5.6	3,939	20	W., S., SE	N.	22	7	2	14	12	6	11	18	0	8	10	12	0	7	0	0	0	0	0	D.
4.6	3.6	3.5	3.9	78,237	..	....	W.	115	56	14	64	66	268	362	132	17	165	134	65	35	64	0	0	2	1	0	Y.

Monthly and yearly meteorological summaries—**Continued.**

SAN LUIS OBISPO, CAL.

[Latitude, 35° 18′ N.; longitude, 120° 39′ W.]

Months and year.	Pressure.			Temperature.						Mean.		Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.765	30.02	29.23	47.0	58.4	53.5	53.0	74	33	61.4	46.7	43	49	49	47	85	72	84	80	5.83	1.52
F ..	29.751	29.97	29.42	48.0	65.4	56.5	56.6	82	39	69.2	47.5	43	52	49	48	82	62	78	74	.81	.46
M .	29.741	29.99	29.36	42.4	59.0	49.7	50.4	72	34	61.7	42.0	38	47	46	44	86	67	87	80	2.42	.75
A ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....
M .	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....
J ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....
J ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....
A ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....
S ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....
O ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....
N ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....
D ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....
Y ..	......	......	......	.....	.....	.....	.....	...	...	.....	.....	...	...	...	...	...	...	...	...	.....	.....

SANTA FÉ, N. MEX.

[Latitude, 35° 41′ N.; longitude, 105° 57′ W.]

J ..	23.175	23.42	22.77	19.7	30.5	25.3	25.2	48	–6	34.2	15.9	15	20	19	18	81	64	76	74	.70	.25
F ..	23.259	23.60	22.89	27.1	40.7	32.2	33.3	56	9	44.8	23.8	21	22	22	22	76	48	67	64	.85	.65
M .	23.150	23.44	22.82	27.4	43.4	34.3	35.0	65	4	47.5	24.0	18	14	19	17	70	35	56	54	.47	.21
A ..	23.163	23.39	22.88	36.5	50.7	43.9	43.7	72	21	56.0	33.6	25	20	24	23	65	35	47	49	1.33	.80
M .	23.345	23.53	23.13	49.4	70.1	59.7	59.7	83	34	73.5	47.7	28	24	28	26	44	18	31	31	1.21	.12
J ..	23.337	23.51	23.10	53.9	73.4	63.4	63.6	86	44	77.0	52.5	38	38	38	38	57	30	43	43	.95	.29
J ..	23.394	23.54	23.21	60.9	80.3	70.7	70.6	93	55	84.0	59.8	46	48	49	48	61	34	50	48	1.54	.45
A ..	23.401	23.52	23.29	58.0	73.2	64.7	65.3	86	51	77.5	56.6	50	49	51	50	77	45	62	61	4.15	1.41
S ..	23.366	23.55	23.18	50.1	65.6	56.4	57.4	75	38	69.4	48.5	42	43	43	43	76	47	64	62	4.02	1.27
O ..	23.350	23.63	23.10	42.5	57.6	48.6	49.6	69	30	61.1	40.2	32	29	32	31	67	37	55	53	1.06	.58
N ..	23.277	23.59	22.86	27.1	41.4	32.6	33.7	59	(*)	45.5	23.3	16	14	15	15	63	35	50	49	.30	.12
D ..	23.297	23.52	23.02	27.5	42.6	31.8	34.0	54	13	45.3	24.1	16	17	18	17	62	38	57	52	.32	.32
Y ..	23.293	23.63	22.77	40.0	55.8	47.0	47.6	93	–6	59.6	37.5	29	28	30	29	67	39	55	53	15.90	.....

SAVANNAH, GA.

[Latitude, 32° 5′ N.; longitude, 81° 5′ W.]

J ..	29.991	30.59	29.35	40.5	52.2	44.9	45.9	70	12	54.5	37.8	37	41	39	39	86	67	80	78	2.92	1.01
F ..	30.070	30.57	29.72	44.3	57.5	49.9	50.6	70	19	60.1	42.4	38	42	43	41	78	58	78	71	2.38	1.20
M .	29.967	30.29	29.53	52.3	62.9	56.5	57.2	77	33	64.0	50.0	48	48	50	49	86	62	80	76	3.16	1.04
A ..	29.991	30.30	29.59	59.7	71.9	62.5	64.7	83	40	73.2	57.4	55	56	56	56	85	58	81	75	2.06	1.10
M .	29.923	30.17	29.64	70.4	82.1	72.5	75.0	93	54	82.9	67.2	63	63	66	64	78	54	80	70	4.37	2.62
J ..	29.905	30.07	29.72	77.2	84.9	77.5	79 9	93	66	86.2	73.2	72	72	73	72	86	66	86	79	7.24	1.50
J ..	29.894	30.08	29.72	77.8	85.6	78.0	80.5	92	69	88.1	74.6	74	74	74	74	88	70	88	82	7.02	2.19
A ..	29.918	30.14	29.67	76.3	85.2	78.1	79.9	93	66	86.8	74.4	73	74	74	74	90	70	89	83	7.32	1.37
S ..	30.021	30.18	29.79	72.6	83.1	75.8	77.2	93	64	83.9	71.0	70	71	72	71	92	67	89	83	1.64	.82
O ..	30.081	30.26	29.85	60.0	73.9	64.7	66.2	83	42	74.3	58.5	56	57	60	58	88	57	84	77	.90	.49
N .	30.076	30.33	29.77	50.8	66.5	56.8	58.0	78	35	69.2	48.5	45	47	50	47	80	52	78	70	.51	.24
D ..	30.067	30.36	29.61	42.3	56.3	46.9	48.5	74	25	57.7	40.6	38	42	42	41	87	62	83	77	3.16	1.16
Y ..	29.992	30.59	29.35	60.4	71.8	63.7	65.3	93	12	73.4	58.0	56	57	58	57	86	62	83	77	42.68	.....

SHREVEPORT, LA.

[Latitude, 32° 30′ N.; longitude, 93° 40′ W.]

J ..	29.881	30.43	29.40	32.9	43.3	38.1	38.1	70	1	48.1	29.1	27	29	27	28	76	61	66	67	3.87	2.00
F ..	29.889	30.43	29.37	40.8	56.3	49.2	48.8	77	20	60.1	38.2	34	38	38	36	77	52	67	65	4.77	1.41
M .	29.793	30.13	29.37	48.5	59.7	54.1	54.1	83	29	64.6	46.5	43	43	45	44	83	60	73	72	6.32	2.71
A ..	29.773	30.11	29.43	57.2	72.5	63.8	64.5	88	37	76.8	56.2	53	52	55	54	86	53	75	72	5.14	1.75
M .	29.750	30.02	29.53	66.7	86.4	74.7	75.9	101	54	89.6	65.4	61	60	64	62	83	42	70	65	.08	.05
J .	29.680	29.86	29.37	72.5	86.9	76.8	78.7	101	64	91.2	71.0	69	68	70	69	88	56	80	75	4.16	2.02
J ..	29.714	29.94	29.48	74.7	90.1	80.1	81.6	100	66	93.2	73.4	71	72	74	72	90	57	83	76	2.58	.60
A ..	29.739	29.99	29.54	74.4	91.3	80.4	82.0	101	64	95.7	73.4	71	71	73	72	90	52	78	73	3.60	1.80
S ..	29.800	30.01	29.60	70.2	85.1	75.4	76.9	97	55	88.6	69.2	67	68	70	68	91	59	83	78	4.98	2.73
O ..	29.926	30.17	29.37	57.2	74.0	62.9	64.7	84	39	76.5	55.9	54	56	58	56	91	55	86	77	3.59	1.77
N ..	29.904	30.36	29.46	47.2	62.8	53.8	54.6	79	27	66.0	44.9	44	46	46	45	87	56	75	73	3.60	1.99
D ..	29.925	30.28	29.59	40.4	52.4	46.1	46.3	72	20	58.3	37.7	36	39	39	38	81	64	78	75	1.52	.47
Y ..	29.815	30.43	29.37	56.9	71.7	63.0	63.9	101	1	75.7	55.1	52	54	55	54	85	56	76	72	44.21	.....

* Zero.

Monthly and yearly meteorological summaries—Continued.

SAN LUIS OBISPO, CAL.

[$H = 270$. $T = 64$. $h = 80$.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	11 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.8	6.3	3.9	5.3	5,806	34	S., SE.	N.	24	10	4	11	14	6	10	9	5	11	8	12	0	13	0	0	0	0	0	J.
2.2	3.7	1.5	2.5	5,072	28	N., NE.	N.	22	13	8	5	4	2	11	13	6	17	10	1	0	3	0	0	0	0	0	F.
3.9	4.8	3.1	3.9	4,938	42	N.	N.	22	1	3	11	11	3	16	14	12	15	11	5	0	9	0	0	0	0	0	M.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	A.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	M.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	J.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	J.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	A.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	S.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	O.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	N.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	D.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Y.

SANTA FÉ, N. MEX.

[$H = 7,026$. $T = 35$. $h = 29$.]

2.7	3.5	2.6	2.9	5,569	28	N.	N.	29	18	8	7	10	12	3	3	3	18	10	3	0	10	12	30	0	0	0	J.
2.3	2.9	1.2	2.1	5,296	25	N.	N., NE.	23	23	8	7	4	6	8	4	1	21	4	3	0	5	0	26	0	0	0	F.
1.5	3.1	1.6	2.1	6,545	29	SW., N.	N.	32	12	10	8	5	10	8	5	3	23	7	1	0	6	1	27	0	0	0	M.
3.2	4.4	2.0	3.2	7,067	38	SE.	N.	16	15	8	15	10	15	7	3	1	15	12	3	0	7	0	11	0	2	0	A.
1.5	3.0	2.5	2.3	5,459	32	N.	E.	10	13	27	7	8	9	15	2	2	22	7	2	0	3	0	0	0	2	0	M.
1.7	2.9	1.6	2.1	4,589	31	N.	E.	7	19	24	5	11	11	8	3	2	20	10	0	0	5	0	0	0	4	0	J.
2.4	3.2	2.5	2.7	4,629	27	N.	E.	8	5	23	13	13	7	6	6	12	19	10	2	0	9	0	0	3	1	0	J.
2.4	3.9	4.1	3.5	4,268	28	N.	E.	9	15	21	11	4	12	6	2	10	15	14	2	0	18	0	0	0	3	0	A.
2.6	2.5	2.5	2.5	3,847	21	S.	E.	9	11	24	15	8	11	5	3	4	19	6	5	0	10	0	0	0	6	0	S.
2.5	1.4	1.3	1.7	4,861	24	N., E.	E.	10	6	26	12	15	13	6	5	0	22	8	1	0	4	0	3	0	0	0	O.
1.8	1.6	1.8	1.7	5,676	28	N.	N.	35	12	6	3	8	10	8	4	4	22	6	2	0	3	4	26	0	0	0	N.
1.2	2.1	0.5	1.3	4,984	26	N.	N.	39	21	6	4	3	5	3	3	9	25	5	1	0	2	6	31	0	0	0	D.
2.2	2.9	2.0	2.4	62,790	...	....	N.	227	170	194	107	99	121	83	43	51	241	99	25	0	82	17	154	3	18	0	Y.

SAVANNAH, GA.

[$H = 87$. $T = 66$. $h = 56$.]

5.3	5.2	4.4	5.0	6,660	32	W.	W.	16	10	11	8	7	7	18	16	0	10	13	8	0	9	2	6	0	0	0	J.
3.8	4.8	3.8	4.1	5,479	28	NW.	NW.	12	7	13	4	7	12	10	19	0	12	9	7	0	9	0	2	0	1	0	F.
5.3	6.4	5.0	5.6	6,370	32	S.	NW.	13	2	11	4	17	10	17	19	0	7	16	8	0	14	0	0	0	1	0	M.
3.9	4.2	3.2	3.8	6,968	37	NE.	E.	7	7	26	7	16	11	10	6	0	13	12	5	0	8	0	0	0	2	0	A.
2.7	3.9	2.5	3.0	5,926	25	SE.	S.	2	2	4	13	23	17	17	15	0	18	9	4	0	6	0	0	4	4	0	M.
4.9	6.1	5.6	5.5	5,071	28	SE.	S.	5	1	13	18	23	16	8	6	0	4	17	9	0	16	0	0	5	8	0	J.
5.3	6.1	4.4	5.3	4,462	26	S.	SW.	4	3	6	11	18	30	14	7	0	3	22	6	0	22	0	0	8	13	0	J.
5.6	5.6	4.1	5.1	4,637	32	NE.	SW.	8	9	4	13	26	27	5	1	0	6	17	8	0	12	0	0	8	10	0	A.
4.7	5.0	3.3	4.3	4,592	23	E.	E.	16	15	29	7	11	7	4	1	0	9	17	4	0	12	0	0	1	0	0	S.
2.9	3.7	2.4	3.0	4,743	27	E.	E.	22	14	26	7	4	1	6	13	0	17	10	4	0	7	0	0	0	1	0	O.
4.0	4.0	2.7	3.6	4,365	28	NW.	SW.	8	4	5	10	10	20	13	17	3	14	13	3	0	5	0	0	0	0	0	N.
5.1	5.5	4.4	5.0	4,741	26	NW.	NW.	14	12	12	6	6	8	15	19	1	11	11	9	0	11	0	7	0	1	0	D.
4.5	5.0	3.8	4.4	64,014	...	....	S.	127	86	160	108	168	166	137	139	4	124	166	75	0	131	2	15	26	41	0	Y.

SHREVEPORT, LA.

[$H = 227$. $T = 33$. $h = 40$.]

5.6	6.3	4.2	5.4	......	...	....	NW.	19	4	7	20	6	4	10	23	0	10	10	11	0	10	4	16	0	3	0	J.
4.4	4.5	4.6	4.5	3,729	24	N.	SE.	11	6	7	19	18	8	6	8	1	10	10	8	0	7	0	4	0	2	0	F.
6.3	6.1	5.0	5.8	5,875	28	W.	S.	8	2	16	6	23	10	13	14	1	11	6	14	0	14	0	2	0	2	0	M.
5.5	5.0	4.0	4.8	4,700	21	E.	S.	10	5	5	16	34	3	4	12	1	11	9	10	0	12	0	0	0	5	0	A.
3.3	3.0	2.3	2.9	4,514	24	S.	S.	13	9	7	7	41	9	2	4	1	20	9	2	0	2	0	0	17	2	0	M.
6.0	5.5	4.1	5.2	4,281	21	N.	SE.	20	11	8	23	16	3	2	7	0	6	16	8	0	13	0	0	19	5	0	J.
3.5	4.3	1.9	3.2	2,843	19	E., NE.	S.	8	9	6	22	26	10	4	1	7	17	10	4	0	11	0	0	23	10	0	J.
1.7	2.8	1.7	2.1	3,003	19	W.	SE.	3	3	16	24	21	9	6	3	8	23	8	0	0	5	0	0	29	5	0	A.
4.0	4.5	2.5	3.7	3,329	18	N.	SE.	4	5	19	26	22	2	4	0	8	14	12	4	0	10	0	0	15	1	0	S.
2.5	3.2	1.7	2.5	3,169	25	E.	SE.	19	11	4	22	13	2	3	5	14	19	12	0	0	4	0	0	0	2	0	O.
5.0	4.2	3.5	4.2	4,294	24	NW.	S.	11	3	1	10	33	10	8	10	4	10	13	7	0	10	0	2	0	1	0	N.
4.3	4.6	4.2	4.4	4,812	25	NW.	S.	14	4	8	16	20	4	7	16	4	14	8	9	0	12	0	7	0	2	0	D.
4.3	4.5	3.3	4.0	......	...	....	S.	140	72	104	211	273	74	69	103	49	165	123	77	0	110	4	31	103	40	0	Y.

Monthly and yearly meteorological summaries—Continued.

SITKA, ALASKA.

[Latitude, 57° 3′ N.; longitude, 135° 19′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J.	29.798	30.37	28.92	28.1	30.4	29.0	29.2	48	4	36.1	22.7	20	20	20	20	71	66	68	68	7.36	2.26
F.	29.585	30.14	28.70	36.0	37.9	37.5	37.1	52	24	41.8	31.9	32	32	32	32	84	80	82	82	18.84	3.49
M.	29.613	30.40	28.74	36.8	39.5	38.2	38.2	49	24	43.2	32.9	32	33	33	33	84	77	80	80	10.08	1.72
A.	29.777	30.29	29.08	38.3	42.9	41.4	40.9	56	28	47.4	33.7	32	32	31	32	77	68	69	72	7.67	2.27
M.	29.847	30.26	29.52	42.6	49.5	48.7	46.9	61	31	54.4	38.5	36	38	40	38	79	67	72	72	3.68	1.64
J.	29.897	30.37	29.54	48.6	54.5	53.8	52.3	68	38	59.7	45.0	43	44	44	44	83	69	72	74	4.53	.88
J.	29.943	30.34	29.37	53.7	59.0	59.0	57.2	72	45	64.0	50.2	49	51	51	50	85	76	75	79	3.27	.92
A.	29.789	30.20	29.39	55.3	59.6	58.6	57.8	72	42	63.1	51.8	51	52	52	52	86	78	79	81	10.72	1.70
S.	29.823	30.32	28.95	51.6	55.7	54.1	53.8	62	39	58.6	49.0	48	50	50	50	88	82	86	85	25.52	4.51
O	29.707	30.14	29.26	44.3	47.7	45.7	45.9	59	31	51.2	41.1	40	41	41	41	85	79	84	83	24.82	4.49
N.	29.741	30.35	28.98	38.2	40.7	39.9	39.6	54	23	45.1	34.4	32	35	34	34	80	80	80	80	20.51	3.43
D.	29.590	30.26	28.92	36.1	39.7	38.2	38.0	52	14	43.3	32.2	27	36	28	28	70	67	66	68	3.26	1.08
Y.	29.759	30.40	28.70	42.5	46.4	45.3	44.7	72	4	50.7	38.6	37	38	38	38	81	74	76	77	140.26	....

SMITHVILLE, N. C.

[Latitude, 33° 55′ N.; longitude, 78° 1′ W.]

J.	30.006	30.71	29.27	35.5	45.0	39.6	40.0	63	8	47.1	32.6	29	37	35	34	78	73	83	78	2.14	1.19
F.	30.085	30.60	29.62	39.4	48.7	43.0	43.7	65	10	51.4	36.1	33	38	37	36	78	67	81	76	2.16	1.01
M.	29.980	30.29	29.46	46.6	54.7	49.8	50.4	69	27	56.9	43.1	42	45	45	44	83	72	85	80	5.46	2.06
A	30.031	30.35	29.49	57.7	65.9	59.2	60.9	76	38	67.5	53.9	54	57	56	56	89	74	89	84	3.10	1.57
M.	29.938	30.25	29.59	67.5	75.1	68.0	70.2	84	45	76.9	62.7	62	64	64	63	82	68	86	79	1.46	.83
J.	29.947	30.16	29.71	74.4	79.3	74.4	76.0	87	59	81.4	69.2	70	71	71	71	87	76	90	84	3.68	1.34
J.	29.924	30.13	29.74	76.9	83.3	78.2	79.5	89	67	84.6	71.9	74	75	75	75	90	77	91	86	11.99	2.52
A.	29.953	30.23	29.72	75.2	80.7	76.3	77.4	87	59	82.2	71.1	72	73	73	73	90	78	91	87	3.36	.82
S.	30.074	30.25	29.83	71.4	79.9	74.5	75.3	86	57	81.1	67.1	68	70	70	69	90	72	87	83	0.52	.28
O.	30.127	30.36	29.86	57.1	71.1	62.4	63.5	83	36	72.4	52.9	53	59	57	56	87	66	82	78	1.16	1.08
N.	......	......	......	....	.....	.....	....	...	....	.....	.....	...	...	...	...	...	...	...	...	......	....
D.	......	......	......	....	.....	.....	....	...	....	.....	.....	...	...	...	...	...	...	...	...	......	....
Y.	......	......	......	....	.....	.....	....	...	....	.....	.....	...	...	...	...	...	...	...	...	......	....

SPOKANE FALLS, WASH.

[Latitude, 47° 40′ N.; longitude, 117° 25′ W.]

J.	27.903	28.48	27.26	17.8	26.6	22.9	22.4	49	–10	30.7	14.9	14	23	19	19	84	86	86	85	3.12	.74
F	27.957	28.38	27.53	32.1	41.7	39.0	37.6	55	13	47.0	29.6	29	37	35	33	88	84	85	86	.61	.23
M.	27.957	28.27	27.47	32.9	45.5	41.5	40.0	67	20	51.0	30.8	28	37	36	34	81	74	79	78	1.07	.62
A.	27.875	28.37	27.53	39.2	53.8	49.8	47.6	68	30	58.8	37.9	31	43	42	38	75	70	77	74	1.18	.45
M.	27.947	28.19	27.60	47.8	66.0	62.0	58.6	88	34	71.0	46.2	31	41	43	38	55	45	54	51	.92	.57
J.	27.939	28.14	27.72	53.7	71.7	68.7	64.7	90	40	77.4	52.4	38	53	54	48	57	56	62	59	.57	.26
J.	27.915	28.10	27.72	58.4	81.1	78.1	72.5	100	46	86.9	57.5	40	56	57	51	54	47	51	51	.37	.30
A.	27.903	28.06	27.70	54.9	77.6	73.2	68.6	96	46	83.1	53.7	38	52	54	48	54	44	54	50	.33	.30
S	27.969	28.35	27.68	40.3	66.5	60.5	57.8	83	31	71.6	44.3	34	50	48	44	66	59	66	64	1.00	.27
O	28.007	28.33	27.75	38.8	53.4	48.7	47.0	77	29	58.0	37.9	33	43	42	39	81	72	78	77	2.11	.74
N.	28.146	28.59	27.40	26.3	36.9	33.9	32.4	54	25	42.9	24.2	22	30	30	27	85	76	85	82	.71	.42
D.	27.999	28.45	27.65	32.5	37.0	35.9	35.1	57	14	42.3	30.3	30	34	34	33	90	90	92	91	3.87	.75
Y.	27.960	28.59	27.26	40.1	54.8	51.2	48.7	100	–10	60.1	38.3	31	42	41	38	72	67	72	71	15.86	....

SPRINGFIELD, ILL.

[Latitude, 39° 48′ N.; longitude, 89° 39′ W.]

J.	29.394	29.86	28.81	19.4	25.9	22.7	22.7	58	–13	33.6	13.5	13	18	16	16	75	71	76	74	2.19	.46
F.	29.418	29.97	28.82	26.8	34.9	31.2	31.0	58	–11	42.0	22.2	20	24	24	22	74	65	73	70	1.86	.84
M.	29.300	29.86	28.63	36.1	46.5	41.3	41.3	77	18	50.8	33.0	28	34	33	32	73	64	72	69	2.45	.71
A	29.348	29.69	28.96	50.7	62.4	55.3	56.1	81	24	64.6	47.1	44	47	46	45	76	59	71	68	2.98	.73
M.	29.288	29.66	28.91	59.0	73.1	64.6	65.6	86	43	75.4	54.6	51	55	56	54	75	55	72	67	3.56	1.05
J.	29.306	29.63	29.05	65.6	78.5	70.2	71.4	88	49	81.0	61.6	58	60	61	60	77	54	72	68	3.83	1.20
J	29.300	29.49	29.05	69.5	86.3	77.1	77.6	96	58	88.4	66.6	61	62	64	62	75	45	64	61	.05	.05
A.	29.309	29.52	29.07	69.5	84.1	74.6	76.1	99	54	85.9	67.2	63	65	66	65	81	55	74	70	4.19	1.11
S	29.387	29.65	29.05	61.9	75.6	67.2	68.2	90	45	77.3	58.8	56	59	59	58	82	58	75	72	7.24	3.25
O.	29.510	29.82	28.78	50.4	66.5	56.9	57.9	83	34	68.5	47.9	44	47	48	46	78	51	72	67	.80	.34
N.	29.364	29.75	28.82	37.7	47.3	42.3	42.4	73	20	52.3	33.9	30	32	32	31	73	57	68	66	1.74	.52
D.	29.493	29.90	28.89	22.3	30.8	26.0	26.4	54	– 6	36.2	18.1	16	21	20	19	74	68	76	73	.80	.21
Y.	29.368	29.97	28.63	47.4	59.3	52.4	53.0	99	–13	63.0	43.7	40	44	44	43	76	58	72	69	31.69	....

Monthly and yearly meteorological summaries—Continued.

SITKA, ALASKA.

[H=63. T=12. h=43.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.2	4.5	4.5	4.7	7,915	42	SE.	E.	3	18	31	21	0	0	4	6	10	14	6	11	0	13	9	24	0	0	1	J.
7.6	8.2	8.1	8.0	3,822	68	SE.	SE.	0	0	5	29	1	3	1	2	43	2	7	19	0	26	0	16	0	0	0	F.
7.6	8.0	8.1	7.9	3,201	23	SE.	SE.	0	5	18	23	1	1	2	3	40	1	11	19	0	29	0	11	0	0	1	M.
6.7	6.5	6.4	6.5	7,148	40	E.	E.	2	3	24	9	3	12	15	14	8	4	11	15	0	20	0	11	0	0	5	A.
5.7	6.5	6.4	6.2	6,113	39	SW.	SW.	0	0	7	8	0	42	15	10	11	8	9	14	0	11	0	3	0	0	3	M.
7.5	7.3	6.8	7.2	5,965	34	SW.	SW., W.	0	2	10	15	0	16	16	12	19	1	14	15	0	18	0	0	0	0	0	J.
7.2	6.9	6.5	6.9	5,241	32	NW.	SW.	0	0	0	5	0	38	6	22	22	5	11	15	0	15	0	0	0	0	1	J.
8.6	7.6	7.6	7.9	4,881	32	NW.	SW.	3	0	6	10	4	28	14	11	17	0	12	19	0	17	0	0	0	0	0	A.
8.0	8.5	8.3	8.3	5,975	40	SW.	SW.	0	2	8	12	1	39	2	10	16	1	9	20	0	25	0	0	0	0	2	S.
7.1	7.5	8.2	7.6	7,471	40	SE.	SE.	0	0	26	37	3	3	2	12	10	1	12	18	0	28	0	1	0	0	1	O.
8.5	8.4	8.0	8.3	10,346	55	SE.	E.	3	1	45	11	6	4	12	3	5	1	8	21	0	29	0	5	0	0	1	N.
5.2	5.5	4.5	5.1	9,763	52	E.	E	3	21	25	24	2	0	1	2	15	10	11	10	0	13	3	12	0	0	6	D.
7.1	7.1	7.0	7.1	77,841	..	....	E.	14	52	205	204	21	186	90	107	216	48	121	196	0	244	12	83	0	0	21	Y.

SMITHVILLE, N. C.

[H=34. T=18. h=1.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.7	5.4	5.3	5.5	6,669	44	W.	N.	24	21	5	3	5	3	16	12	4	7	12	12	0	11	2	10	0	1	0	J.
4.2	3.6	2.6	3.5	7,278	40	SW.	NE., W.	15	16	7	4	6	12	16	8	0	15	9	4	0	8	1	9	0	1	0	F.
4.7	5.4	3.1	4.4	8,408	42	S.	W.	13	8	8	8	13	17	20	6	0	13	11	7	0	11	0	6	0	0	0	M.
4.2	4.1	3.1	3.8	8,449	33	S.	NE.	7	19	13	11	4	17	13	5	1	13	11	6	0	9	0	0	0	2	0	A.
2.9	3.6	3.1	3.2	8,879	36	SW.	SW.	4	4	5	8	9	31	19	13	0	18	10	3	0	11	0	0	0	5	0	M.
5.5	5.9	4.5	5.3	8,232	36	SE.	SW.	3	13	10	9	8	25	20	2	0	7	16	7	0	15	0	0	0	4	0	J.
5.7	4.1	4.8	4.9	8,126	44	S.	SW.	2	5	8	8	11	38	16	3	2	10	14	7	0	15	0	0	0	5	0	J.
6.6	5.7	5.8	6.0	7,624	28	SW., W.	SW.	8	18	5	11	10	26	11	4	0	6	13	12	0	16	0	0	0	2	0	A.
4.3	2.7	3.7	3.6	6,336	24	NE.	NE.	3	29	12	15	8	11	7	4	1	13	12	5	0	8	0	0	0	2	0	S.
3.1	2.6	1.8	2.5	6,080	20	N., NE., W.	N.	29	21	15	5	1	7	8	7	0	20	8	3	0	3	0	0	0	2	0	O.
...	...	...	...	......	..	....	......	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	N.
...	...	...	...	......	..	....	......	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	D.
...	...	...	...	......	..	....	......	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Y.

SPOKANE FALLS, WASH.

[H=1,909. T=24. h=40.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.8	7.5	4.7	6.3	3,129	36	SW.	E.	5	13	21	7	5	13	13	0	16	7	10	14	0	14	14	25	0	0	0	J.
3.3	5.4	2.2	3.6	3,136	34	SW.	SW.	4	7	2	4	12	20	10	4	21	14	10	4	0	7	0	19	0	0	0	F.
4.9	5.8	2.2	4.3	4,988	42	SW.	SW.	6	3	11	1	20	25	10	2	15	13	12	6	0	5	0	18	0	0	1	M.
4.4	6.6	3.1	4.7	3,875	26	SW.	SW.	6	10	8	5	11	22	18	3	7	11	12	7	0	13	0	2	0	0	1	A.
3.2	4.7	2.8	3.6	4,324	25	SW., W.	W.	0	5	2	1	2	32	40	0	11	18	8	5	0	5	0	0	0	2	1	M.
2.3	5.9	3.7	4.0	3,845	27	NE.	W.	2	9	3	7	15	15	24	3	12	14	10	6	0	5	0	0	0	1	0	J.
2.0	3.2	2.2	2.5	2,884	23	W.	SW., W.	2	4	3	4	8	25	25	2	20	19	10	2	0	4	0	0	13	1	0	J.
1.0	.9	.7	.9	3,096	25	W.	W.	5	11	0	0	10	13	39	3	12	27	3	1	0	3	0	0	1	2	1	A.
2.0	2.9	1.5	1.8	3,141	32	W.	W.	1	4	4	1	6	12	38	7	17	21	8	1	0	6	0	2	0	0	0	S.
4.4	4.6	2.8	3.9	2,951	25	W.	NE.	11	18	9	3	8	17	16	2	9	15	8	8	0	11	0	7	0	0	0	O.
2.9	5.2	2.9	3.7	2,136	23	SW.	SW.	16	4	7	3	4	25	17	3	11	15	12	3	0	8	1	25	0	0	0	N.
7.2	8.4	6.8	7.5	3,048	25	SW.	SW.	3	20	8	6	8	31	9	5	3	2	11	18	0	23	2	15	0	0	0	D.
3.7	5.1	3.0	3.9	40,553	..	....	W.	61	108	78	42	109	250	259	34	154	176	114	75	0	104	17	113	14	6	4	Y.

SPRINGFIELD, ILL.

[H=644. T=39. h=61.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.0	6.7	6.0	6.2	7,895	29	NW., N.	NW.	9	7	4	14	15	6	9	27	2	5	15	11	0	11	12	28	0	0	0	J.
4.4	4.8	4.0	4.4	8,044	36	S.	S.	8	3	2	6	24	8	8	22	3	11	10	7	1	8	5	18	0	0	0	F.
5.0	6.5	5.5	5.7	8,170	36	SE.	NW.	8	12	8	8	18	11	8	19	1	7	13	11	0	12	0	12	0	1	0	M.
5.7	6.7	3.5	5.3	7,411	28	N., W.	S.	10	15	6	16	24	5	7	5	2	7	14	9	0	8	0	6	0	6	0	A.
3.8	6.1	3.4	4.4	5,427	26	NW.	S.	10	17	11	6	18	11	3	9	8	9	15	7	0	9	0	0	0	8	0	M.
3.6	5.4	2.3	3.8	4,165	24	NW.	S., SE.	8	10	8	13	13	7	7	12	12	13	12	5	0	11	0	0	0	6	0	J.
3.2	3.0	2.1	2.8	3,733	20	N.	NE.	13	15	11	11	8	5	6	4	20	17	13	1	0	1	0	0	10	1	0	J.
3.5	4.0	1.9	3.1	4,606	33	W.	S.	10	5	12	6	19	10	6	7	18	14	16	1	0	10	0	0	8	6	0	A.
5.6	4.9	3.5	4.7	5,404	24	S.	S.	7	2	1	12	26	18	6	9	9	10	15	5	0	8	0	0	0	5	0	S.
2.5	3.7	1.9	2.7	5,155	34	SW.	S.	7	3	4	3	35	13	5	15	8	20	7	4	0	6	0	0	0	0	0	O.
5.3	5.9	4.2	5.1	7,344	34	W.	W.	8	7	5	6	13	15	18	13	5	8	13	9	0	7	0	13	0	0	0	N.
4.8	6.5	3.8	5.0	5,937	28	N., S.	S.	13	10	4	6	24	0	5	22	9	10	13	8	0	11	10	28	0	0	0	D.
4.4	5.4	3.5	4.4	73,291	..	....	S.	111	106	76	107	237	109	88	164	97	131	156	78	1	102	27	105	18	33	0	Y.

Monthly and yearly meteorological summaries—**Continued.**

TATOOSH ISLAND, WASH.

[Latitude, 48° 23′ N.; longitude, 124° 44′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	11 p.m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a.m.	3 p.m.	11 p.m.	Mean.	7 a.m.	3 p.m.	11 p.m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.828	30.44	28.88	38.8	40.1	39.5	39.5	51	21	43.6	35.3	32	33	34	33	77	77	81	78	16.82	2.68
F ..	29.984	30.49	29.44	43.8	45.1	44.4	44.4	55	35	48.1	40.8	40	41	40	40	87	85	87	86	10.29	2.74
M ..	29.893	30.38	29.55	41.5	45.2	43.6	43.4	52	33	47.4	39.2	38	38	38	38	86	78	82	82	10.89	1.99
A ..	29.847	30.26	29.22	44.6	48.8	46.1	46.5	56	35	50.7	42.8	41	42	42	41	87	79	85	83	7.04	1.01
M ..	29.941	30.25	29.66	48.5	52.7	51.0	50.7	62	39	56.5	46.7	45	47	45	46	88	81	81	83	3.45	.82
J ..	29.947	30.12	29.76	51.1	57.1	54.7	54.3	64	45	60.3	49.9	49	52	50	50	92	84	85	87	3.13	1.27
J ..	29.903	30.10	29.56	55.0	60.0	57.9	57.6	75	50	63.5	53.7	53	55	54	54	92	85	87	88	6.52	2.35
A ..	29.883	30.13	29.62	54.6	58.8	56.3	56.6	67	49	61.8	52.5	53	56	54	54	96	90	93	93	4.70	1.40
S ..	29.915	30.27	29.56	52.1	55.4	53.7	53.7	68	45	59.0	49.7	50	51	51	51	93	87	91	90	5.54	2.33
O ..	29.933	30.20	29.55	49.2	51.5	49.8	50.2	60	41	54.2	46.8	46	47	46	46	89	85	88	88	7.81	2.12
N ..	30.061	30.59	29.31	44.5	46.5	45.4	45.5	53	31	48.7	41.6	41	41	41	41	88	83	86	85	10.44	2.97
D ..	29.784	30.29	29.34	45.7	45.9	46.0	45.9	54	29	49.3	42.2	43	43	44	43	90	91	92	91	25.84	4.02
Y ..	29.910	30.59	28.88	47.4	50.6	49.0	49.0	75	21	53.6	45.1	44	46	45	45	89	84	87	86	112.47	....

TOLEDO, OHIO.

[Latitude, 41° 40′ N.; longitude, 83° 34′ W.]

J ..	29.321	29.91	28.70	18.9	23.7	19.6	20.7	53	-11	27.8	13.2	14	16	15	15	81	73	81	78	2.79	.61
F ..	29.365	29.92	28.60	22.4	29.0	24.7	25.4	58	- 8	33.6	17.5	18	18	19	18	84	65	78	75	1.32	.32
M ..	29.250	29.76	28.45	29.7	38.4	33.8	34.0	68	8	42.7	26.8	26	27	28	27	84	65	79	76	2.28	.82
A ..	29.364	29.73	28.74	43.9	55.6	47.4	49.0	83	21	58.4	40.5	38	39	40	39	80	59	77	72	2.08	1.35
M ..	29.260	29.64	28.86	53.2	67.1	58.7	59.7	86	38	70.0	49.5	46	44	48	46	76	45	68	63	4.50	1.32
J ..	29.288	29.53	28.96	61.8	73.3	64.8	66.6	91	45	76.5	57.0	54	53	55	54	77	52	72	67	2.69	.81
J ..	29.284	29.51	29.05	64.9	79.3	70.1	71.4	96	54	82.4	60.9	57	55	59	57	74	46	68	62	.59	.42
A ..	29.311	29.59	29.00	64.1	75.7	68.2	69.3	92	49	79.7	61.5	59	59	59	59	84	58	74	72	3.13	1.13
S ...	29.390	29.70	28.98	58.7	70.7	61.7	63.7	88	40	74.3	55.3	54	53	54	54	85	57	77	73	6.17	1.37
O ..	29.492	29.80	28.68	46.5	61.6	52.1	53.4	80	34	63.9	44.4	41	42	44	42	82	51	75	70	1.60	.67
N ..	29.308	29.69	28.59	33.8	40.6	35.5	36.6	70	19	44.4	30.0	27	26	27	27	76	60	74	70	2.77	1.25
D ..	29.428	29.89	28.81	18.8	26.3	21.8	22.3	54	- 1	28.9	14.5	14	17	17	16	84	70	82	78	2.78	.79
Y ..	29.338	29.92	28.45	43.1	53.4	46.5	47.7	95	-11	56.9	39.3	37	38	39	38	81	58	75	72	32.70	....

UNALASKA, ALASKA.

[Latitude, 53° 53′ N.; longitude, 166° 32′ W.]

J ...	29.643	30.29	28.69	33.7	33.3	33.7	33.6	43	17	37.2	30.6	29	28	29	29	81	82	82	82	15.82	3.18
F ..	29.528	30.32	28.54	27.5	27.8	28.4	27.9	46	9	32.0	23.8	21	22	22	22	77	79	75	77	7.64	1.70
M ..	29.743	30.48	28.52	31.6	32.2	32.9	32.2	45	13	37.9	27.8	24	25	25	25	74	73	73	74	4.74	.78
A ..	29.718	30.44	29.00	34.8	36.4	37.1	36.1	55	26	41.7	32.3	28	30	30	30	76	79	77	77	14.09	4.86
M ..	29.948	30.43	29.31	40.0	43.0	43.9	42.3	59	31	49.0	37.9	34	35	35	34	78	73	73	74	3.71	2.38

VALENTINE, NEBR.

[Latitude, 42° 50′ N; longitude, 100° 32′ W.]

J ...	27.348	27.79	26.86	0.7	14.3	6.3	7.1	57	-30	21.0	- 4.7	-4	2	(*)	- 1	79	62	76	72	.19	.12
F ..	27.286	27.68	26.77	19.6	34.8	26.7	27.0	66	-19	40.3	16.5	13	17	19	16	75	53	73	67	.35	.10
M ..	27.257	27.59	26.64	19.6	33.6	26.8	26.7	74	- 8	38.5	17.8	14	19	19	19	77	60	72	69	.53	.24
A ..	27.226	27.68	26.69	35.8	50.9	44.7	43.8	78	13	56.7	33.8	28	30	33	30	73	49	66	63	1.39	.38
M ..	27.281	27.54	26.94	52.2	70.4	60.5	61.0	95	35	74.6	49.8	43	40	46	43	72	36	62	56	3.26	1.54
J ..	27.317	27.66	26.95	57.0	73.6	64.7	65.1	91	43	76.7	54.9	50	48	52	50	77	43	65	62	2.25	.62
J ..	27.301	27.53	27.06	66.3	85.9	74.8	75.7	103	44	89.7	63.3	58	55	57	57	76	38	57	57	2.04	.91
A ..	27.288	27.48	27.06	62.3	82.3	71.1	71.9	98	37	85.4	60.1	56	53	57	55	81	40	64	62	1.86	1.01
S ..	27.285	27.59	26.87	49.7	70.3	58.7	59.6	93	35	74.0	47.1	41	38	44	41	74	35	60	57	1.18	1.00
O ..	27.329	27.85	26.91	42.7	62.4	50.8	52.0	81	23	65.8	38.2	37	38	37	37	81	46	64	64	.27	.24
N ..	27.301	27.70	26.67	25.8	36.6	27.3	29.9	59	- 3	40.2	20.1	19	22	20	20	77	60	75	70	.56	.42
D ..	27.347	27.89	26.94	15.8	24.1	17.6	19.2	61	-16	30.3	8.0	12	17	13	14	84	77	84	82	.10	.02
Y ..	27.297	27.89	26.64	37.3	53.3	44.2	44.9	103	-30	57.8	33.7	30	32	33	32	77	50	68	65	13.98	....

* Zero.

Monthly and yearly meteorological summaries—Continued.

TATOOSH ISLAND, WASH.

[H=86. T=5. h=1.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Aurora.	Months and year.
7.0	8.0	7.6	7.5	14,493	54	E.	E.	0	2	47	20	6	9	4	5	0	2	10	19	0	23	1	10	0	0	1	J.
8.8	7.9	7.5	8.1	10,183	56	SE.	SW.	0	8	17	17	11	18	3	9	1	2	4	22	0	20	0	0	0	0	0	F.
5.8	5.8	5.9	5.8	10,216	47	NW., SE.	SW.	2	6	16	16	13	22	5	12	1	8	9	14	0	19	0	0	0	0	0	M.
7.2	5.9	6.8	6.6	8,405	48	NW.	SE.	2	4	18	22	6	15	14	9	0	4	13	13	0	22	0	0	0	0	1	A.
7.4	5.9	6.1	6.5	7,323	37	NE.	E.	0	8	18	17	3	16	16	15	0	3	15	13	0	20	0	0	0	0	2	M.
7.8	5.7	4.9	6.1	5,719	25	SE.	SW.	0	5	5	18	6	38	7	11	0	4	17	9	0	14	0	0	0	0	4	J.
7.8	5.5	5.4	6.2	6,496	33	E.	SW.	1	1	8	27	14	29	6	7	0	5	15	11	0	9	0	0	0	0	1	J.
5.4	4.2	3.9	4.5	6,423	28	NE.	SE.	0	7	5	28	21	22	1	6	3	13	9	9	4	11	0	0	0	0	0	A.
4.2	3.0	4.7	4.0	7,982	46	E.	SW.	0	13	18	19	8	24	1	2	5	11	13	6	0	11	0	0	0	1	1	S.
5.3	6.0	4.5	5.3	7,630	39	SE., E.	E.	0	3	42	15	3	18	2	5	5	9	12	10	0	17	0	0	0	1	0	O.
5.7	6.8	5.4	6.0	10,425	43	SE.	E.	0	3	39	25	4	6	7	6	0	7	11	12	0	18	0	1	0	0	0	N.
8.3	8.7	8.5	8.5	12,452	51	SE.	SE.	0	0	30	31	6	13	4	7	2	0	7	24	0	31	0	2	0	1	0	D.
6.7	6.1	5.9	6.2	107,747	..	....	E.	5	60	263	255	101	230	70	94	17	68	135	162	4	215	1	13	0	3	10	Y.

TOLEDO, OHIO.

[H=651. T=115. h=100.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Aurora.	Months and year.
7.8	7.4	7.1	7.4	5,247	37	W.	W.	9	10	5	10	9	13	20	10	7	3	11	17	0	21	18	27	0	0	0	J.
6.4	7.3	6.3	6.7	6,787	40	SW.	SW.	6	8	3	1	15	25	13	9	4	2	15	11	1	12	12	23	0	0	0	F.
6.0	6.2	4.7	5.6	7,331	29	NE.	SW.	6	14	12	3	14	21	7	16	0	8	13	10	0	12	2	24	0	0	0	M.
5.5	5.5	4.4	5.1	7,158	33	NE.	NE.	11	24	13	6	14	12	5	5	0	8	14	8	0	7	1	9	0	1	0	A.
4.4	5.0	4.2	4.6	5,387	23	NE., NW.	SW.	11	8	12	7	11	19	18	7	0	10	17	4	0	11	0	0	0	9	0	M.
4.6	5.8	3.3	4.6	4,800	26	NW.	W.	11	12	8	10	15	10	16	7	1	9	17	4	0	7	0	0	1	4	0	J.
3.3	5.1	2.7	3.7	4,834	27	NE.	NE.	14	16	13	13	8	12	8	5	4	15	12	4	0	5	0	0	6	2	1	J.
5.1	5.9	3.5	4.8	4,841	26	W.	NE., SW.	12	17	8	4	16	17	5	14	0	8	17	6	0	11	0	0	2	4	0	A.
4.7	5.7	3.8	4.7	4,710	26	W., SW., NW.	SW.	2	9	5	13	12	22	18	7	2	6	19	5	0	16	0	0	0	4	0	S.
4.7	4.6	3.5	4.3	5,222	44	SW.	SW.	9	7	6	8	12	25	18	7	1	14	10	7	0	5	0	0	0	0	0	O.
7.0	7.0	6.3	6.8	7,465	36	SW.	SW.	7	5	4	1	13	39	11	10	0	4	13	13	0	12	4	22	0	0	0	N.
5.1	6.7	6.5	6.1	6,184	32	W.	SW.	10	10	5	2	9	32	13	10	2	7	9	15	0	15	20	30	0	0	0	D.
5.4	6.0	4.7	5.4	69,966	..	....	SW.	108	140	94	78	148	247	152	107	21	94	167	104	1	134	57	135	9	24	1	Y.

UNALASKA, ALASKA.

[H=13. T=15. h=1.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Aurora.	Months and year.
8.1	8.2	8.3	8.2	9,552	46	E.	SE.	10	6	16	26	14	8	2	8	3	2	7	22	0	26	5	14	0	0	0	J.
8.7	9.1	8.9	8.9	10,084	40	NW.	N.	29	3	1	12	8	8	2	21	0	0	4	24	0	23	14	20	0	0	0	F.
6.8	7.7	8.0	7.5	10,906	40	SE., SW.	SW.	3	3	5	7	16	29	12	18	0	2	11	18	0	23	3	23	0	0	0	M.
6.9	8.4	7.8	7.7	9,762	40	SE.	SE.	4	7	6	27	4	15	6	21	0	0	13	17	0	26	0	10	0	0	0	A.
7.2	7.7	8.5	7.8	5,648	36	SE.	SW.	6	4	0	18	9	19	2	7	1	0	8	14	0	9	0	1	0	0	0	M.

VALENTINE, NEBR.

[H=2,604. T=51. h=42.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Aurora.	Months and year.
6.5	6.1	3.4	5.3	9,172	66	NW.	N.	28	1	3	2	3	16	7	20	13	6	18	7	0	5	22	31	0	0	0	J.
5.9	5.9	5.4	5.7	9,113	75	NW.	W.	12	2	9	4	9	11	17	16	4	7	12	9	0	7	8	26	0	0	0	F.
6.8	6.8	4.5	6.0	10,058	44	NW., N.	N.	25	8	5	6	9	16	12	10	2	6	16	9	1	7	10	29	0	0	0	M.
6.4	6.8	5.2	6.1	10,880	60	N.	S.	16	1	7	13	23	8	4	16	2	7	10	13	0	11	3	12	0	2	0	A.
4.8	6.0	5.6	5.5	8,113	54	E.	E.	15	5	18	11	12	12	8	9	3	5	20	6	0	12	0	0	1	5	2	M.
5.7	6.5	4.2	5.5	7,211	38	S.	E.	15	3	18	4	14	9	8	13	6	8	13	9	0	13	0	0	1	8	1	J.
4.6	3.7	3.7	4.0	8,665	44	SW., W.	S.	5	8	8	6	27	23	4	8	4	12	15	4	0	10	0	0	16	5	1	J.
4.4	3.9	3.6	4.0	8,304	42	N.	SW.	8	9	3	13	16	26	6	12	0	14	12	5	0	6	0	0	13	4	1	A.
3.7	3.5	3.3	3.5	8,551	42	NW.	NW.	5	6	5	11	8	20	5	28	2	15	11	4	0	7	0	0	3	1	0	S.
4.1	3.7	2.4	3.4	9,397	48	NW.	SW.	3	8	2	11	10	35	3	21	0	16	10	5	0	2	0	7	0	1	0	O.
4.0	5.2	4.4	4.5	10,509	55	NW.	NW.	6	8	1	1	2	20	6	45	1	10	12	8	0	8	7	25	0	0	0	N.
4.9	6.6	6.0	5.8	8,371	56	NW.	NW.	13	5	3	8	4	24	6	30	0	7	13	11	0	9	16	29	0	0	0	D.
5.2	5.4	4.3	5.0	108,344	..	....	NW.	151	64	82	90	137	220	86	228	37	113	162	90	1	97	66	159	34	26	5	Y.

Monthly and yearly meteorological summaries—Continued.

VICKSBURG, MISS.

[Latitude, 32° 22′ N.; longitude, 90° 53′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew point. 7 a. m.	Dew point. 3 p. m.	Dew point. 11 p. m.	Dew point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ..	29.880	30.43	29.47	34.3	41.9	37.9	38.0	72	3	46.9	30.4	30	33	32	32	85	72	78	79	7.84	2.55
F ..	29.912	30.46	29.46	40.9	54.6	48.9	48.1	75	16	59.4	38.7	34	38	37	36	78	56	66	67	4.97	2.07
M .	29.802	30.12	29.38	49.3	62.1	55.5	55.6	83	29	65.7	47.2	44	42	43	43	84	54	65	68	6.07	1.75
A ..	29.798	30.02	29.45	57.1	71.9	63.6	64.2	88	35	75.2	54.9	52	51	52	52	83	52	68	68	9.99	2.75
M .	29.776	30.02	29.60	67.1	80.6	72.1	73.3	92	51	82.7	64.1	61	59	60	60	81	49	68	66	1.52	1.01
J ..	29.707	29.88	29.42	72.6	82.4	74.2	76.4	93	66	85.9	69.8	70	69	70	70	90	66	86	81	9.63	2.46
J ..	29.731	29.96	29.49	74.6	87.1	78.2	80.0	96	66	89.9	72.0	71	71	73	72	89	59	84	78	1.58	.62
A ..	29.756	29.96	29.55	74.4	87.8	79.0	80.4	96	66	90.7	72.3	71	71	72	71	90	59	79	76	2.42	.93
S ..	29.828	29.97	29.63	70.4	84.8	74.8	76.7	92	53	87.1	69.1	67	69	68	68	90	62	81	78	5.13	2.08
O ..	29.934	30.15	29.51	56.8	75.6	63.7	65.4	85	36	77.4	55.7	53	54	54	54	88	49	72	70	.64	.55
N ..	29.918	30.34	29.50	48.9	61.8	54.2	55.0	81	28	65.9	45.6	44	45	44	44	83	57	71	70	4.34	2.30
D ..	29.936	30.17	29.58	41.1	53.0	46.7	46.9	69	19	56.6	38.3	36	37	37	37	82	58	70	70	1.76	.72
Y ..	29.832	30.46	29.38	57.3	70.3	62.4	63.3	96	3	73.6	54.8	52	53	53	53	85	57	74	72	55.89	....

WALLA WALLA, WASH.

[Latitude, 46° 2′ N.; longitude, 118° 20′ W.]

J ..	28.993	29.63	28.35	23.6	28.3	25.5	25.8	60	−5	33.5	19.0	21	22	21	22	90	80	87	86	3.45	.73
F ..	29.023	29.48	28.56	38.0	47.6	44.0	43.2	66	23	53.9	35.5	33	34	36	34	81	62	75	73	1.29	.44
M .	28.948	29.34	28.57	39.0	49.5	45.0	44.5	74	22	54.5	36.4	29	27	31	29	68	44	59	57	1.06	.34
A ..	28.851	29.40	28.42	45.0	58.1	53.0	52.0	73	34	63.5	42.4	34	30	34	33	66	38	53	52	1.66	.43
M .	28.910	29.23	28.59	52.2	68.7	63.4	61.4	91	36	75.3	49.8	38	35	40	38	59	30	46	45	.67	.57
J ..	28.895	29.12	28.71	58.9	74.3	70.7	68.0	93	44	81.3	56.8	41	40	43	42	53	32	40	42	.73	.24
J ..	28.846	29.10	28.69	66.3	83.0	80.7	76.7	104	50	90.6	64.5	45	46	45	45	48	28	30	35	.02	.02
A ..	28.843	29.02	28.64	63.8	81.0	76.9	73.9	100	54	88.2	61.6	43	44	41	42	48	28	28	35	.12	.12
S ..	28.933	29.30	28.65	56.1	71.8	64.1	64.0	91	38	77.9	52.8	38	37	37	37	52	29	38	40	.06	.04
O ..	28.997	29.29	28.74	45.1	55.4	50.1	50.2	78	33	60.7	43.0	38	38	41	39	78	54	72	68	1.95	.48
N ..	29.143	29.60	28.37	35.4	43.6	40.4	39.8	69	19	50.3	31.5	28	29	29	29	77	60	67	68	.78	.25
D ..	28.991	29.37	28.64	37.6	41.7	39.7	39.7	63	13	47.9	33.7	31	34	33	33	80	76	80	79	4.41	.86
Y ..	28.948	29.63	28.35	46.8	58.6	54.5	53.3	104	−5	64.8	43.9	35	35	36	35	67	47	56	57	16.20	....

WASHINGTON, D. C.

[Latitude, 38° 54′ N.; longitude, 77° 3′ W.]

J ..	29.973	30.75	28.86	25.2	33.6	27.9	28.9	60	−1	36.4	22.4	22	26	23	24	87	75	82	82	5.01	2.28
F ..	30.002	30.52	29.27	26.3	38.5	31.6	32.1	67	−2	42.4	23.9	22	27	25	25	83	66	80	76	4.32	1.28
M .	29.862	30.34	29.17	36.8	48.1	41.0	42.0	69	13	50.7	34.3	31	32	33	32	80	58	74	71	6.41	1.82
A ..	29.991	30.41	29.30	49.1	63.9	53.4	55.5	88	34	65.5	46.3	45	48	48	47	87	59	81	76	2.71	1.40
M .	29.830	30.21	29.45	57.1	68.9	60.3	62.1	84	43	70.8	53.9	53	57	56	55	86	69	87	80	10.60	3.50
J ..	28.873	30.19	29.51	66.3	75.6	67.7	69.9	89	50	78.2	61.9	62	66	64	64	88	73	89	83	6.75	4.16
J ..	29.838	30 13	29.64	69.6	80.8	71.4	73.9	91	60	82.4	66.1	64	64	66	64	82	57	84	74	10.63	3.34
A ..	29.885	30.23	29.59	68.4	80.2	70.6	73.1	92	56	81.9	64.8	64	63	65	64	85	58	82	75	2.43	1.25
S ..	30.028	30.32	29.62	63.9	76.9	67.1	69.3	91	47	78.5	60.2	59	59	61	60	84	56	81	74	1.79	.67
O ..	30.075	30.40	29.70	50.8	67.3	54.7	57.6	83	33	68.6	46.7	46	46	48	46	82	49	79	70	1.20	.92
N ..	29.946	30.37	29.40	41.4	52.0	44.8	46.1	73	22	55.8	36.5	33	31	34	33	73	49	68	63	2.88	.91
D ..	30.049	30.46	29.43	27.0	35.8	29.3	30.7	54	11	38.8	22.9	21	24	22	23	79	65	77	74	3.44	.83
Y ..	29.946	30.75	28.86	48.5	60.1	51.6	53.4	92	−2	62.5	45.0	43	45	46	45	83	61	80	75	58.17	....

WILMINGTON, N. C.

[Latitude, 34° 14′ N.; longitude, 77° 57′ W.]

J ..	29.995	30.66	29.21	37.4	48.5	41.3	42.4	69	11	51.2	33.1	31	38	35	35	78	70	76	75	3.90	1.84
F ..	30.075	30.59	29.58	39.1	53.0	42.8	45.0	70	10	56.1	32.7	34	40	36	37	84	64	79	76	2.15	1.12
M .	29.970	30.27	29.42	47.4	59.7	50.3	52.5	78	29	62.6	42.6	41	42	44	42	79	57	78	72	5.60	3.37
A ..	30.020	30.34	29.51	57.9	69.0	59.3	62.1	87	39	72.3	53.1	51	50	54	52	79	53	82	72	3.26	1.31
M .	29.927	30.25	29.58	66.7	77.3	66.7	70.2	94	47	79.9	61.5	59	57	60	59	77	52	80	70	1.18	.29
J ..	29.937	30.16	29.70	73.1	80.1	72.7	75.3	92	56	83.6	67.8	68	67	69	68	86	67	88	80	8.81	2.12
J ..	29.907	30.12	29.73	75.6	84.1	76.2	78.6	94	66	87.4	71.2	72	71	73	72	89	65	89	81	21.12	7.33
A ..	29.939	30.22	29.69	74.4	82.3	74.4	77.0	93	60	85.5	70.5	71	71	71	71	89	69	89	82	4.38	1.22
S ..	30.062	30.25	29.81	70.7	82.2	71.7	74.9	91	58	84.8	66.7	67	67	68	67	88	60	87	78	1.34	.61
O ..	30.114	30.37	29.84	56.7	74.2	61.1	64.0	87	38	76.5	53.3	53	53	54	53	87	49	78	71	.48	.45
N ..	30.075	30.33	29.72	49.1	64.4	52.3	55.3	77	30	67.7	43.5	43	40	45	42	78	43	77	66	.19	.12
D ..	30.084	30.44	29.56	39.8	52.9	43.3	45.3	69	22	55.5	36.0	35	38	37	37	84	60	79	74	4.02	1.54
Y ..	30.009	30.66	29.21	57.3	69.0	59.3	61.9	94	10	71.9	52.7	52	53	54	53	83	59	82	75	56.43	....

Monthly and yearly meteorological summaries—Continued.

VICKSBURG, MISS.

[H=222. T=52. h=54.]

Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Wind. Total (miles).	Maximum.	Direction.	Prevailing direction	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Number of days— Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.9	7.0	5.4	6.4	3,805	27	W.	NW.	14	4	12	13	4	5	2	17	22	6	12	13	0	11	4	16	0	0	0	J.
5.0	5.6	4.0	4.9	4,014	30	N.	SE.	9	7	13	16	12	7	5	5	10	10	10	8	0	8	0	5	0	4	0	F.
6.6	6.5	4.4	5.8	4,304	28	W.	SE.	9	11	9	17	9	12	5	11	10	7	12	12	0	14	0	1	0	2	0	M.
5.9	5.9	3.2	5.0	4,481	26	N.	SE.	8	9	17	20	19	5	1	9	2	9	14	7	0	13	0	0	0	5	0	A.
4.6	3.9	2.1	3.5	5,208	20	SE.	SW.	9	12	6	11	9	28	7	9	2	14	15	2	0	4	0	0	3	0	0	M.
5.3	6.9	4.2	5.5	4,186	24	SE., S.	SE.	9	19	4	36	4	6	4	7	1	5	18	7	0	18	0	0	4	4	0	J.
4.1	5.3	2.3	3.9	3,233	21	SW.	SE.	8	11	9	19	10	10	10	5	11	11	18	2	0	7	0	0	14	3	0	J.
3.5	5.3	1.7	3.5	3,280	24	S.	SE.	4	13	10	15	14	6	11	9	11	15	15	1	0	9	0	0	22	1	0	A.
5.4	5.6	2.3	4.4	3,925	20	SW.	SE.	3	15	24	26	5	8	3	5	1	11	13	6	0	9	0	0	9	0	0	S.
2.7	3.1	1.5	2.4	3,740	25	S.	NE.	15	22	13	13	4	4	2	8	12	22	6	3	0	4	0	0	0	0	0	O.
5.0	5.9	3.7	4.9	4,815	24	NW.	S.	5	10	1	11	29	13	9	6	6	9	12	9	0	13	0	1	0	0	0	N.
5.5	5.4	4.7	5.2	5,249	30	SE.	SE.	13	17	8	18	16	5	4	8	4	9	11	11	0	8	1	8	0	0	0	D.
5.0	5.5	3.3	4.6	50,240	...	....	SE.	106	150	126	215	135	109	63	99	92	128	156	81	0	118	5	31	52	19	0	Y.

WALLA WALLA, WASH.

[H=1018. T=66. h=57.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.4	7.2	6.5	6.7	4,419	30	SW., S.	SW.	1	0	0	5	12	58	10	6	1	4	14	13	0	18	12	24	0	0	0	J.
5.3	5.3	4.6	5.1	4,361	35	SW.	SW.	0	2	2	6	16	47	11	0	0	9	9	10	1	9	0	7	0	0	0	F.
5.5	6.0	5.3	5.6	6,256	44	SW.	SW.	1	5	2	11	30	35	5	4	0	7	15	9	0	7	0	4	0	0	1	M.
5.0	5.7	5.1	5.3	5,185	26	SW.	SW.	0	3	1	13	26	27	16	3	1	8	15	7	0	10	0	0	0	0	0	A.
3.8	3.9	3.7	3.8	5,177	40	SW.	SW.	4	6	4	8	18	32	18	3	0	12	16	3	0	4	0	0	2	1	1	M.
4.7	4.4	5.0	4.7	4,853	24	SW., W	SW.	3	1	5	13	19	26	20	2	1	10	11	9	0	10	0	0	5	3	1	J.
2.6	2.7	3.5	2.9	4,383	22	SW., S.	S.	5	4	2	5	32	15	28	6	1	17	12	2	0	1	0	0	19	0	0	J.
0.7	0.4	0.8	0.6	4,002	20	S.	S.	2	3	3	7	31	19	14	13	1	30	1	0	0	1	0	0	12	1	0	A.
1.7	2.3	1.3	1.8	4,574	36	SW.	SW.	2	2	3	19	20	24	16	4	0	22	8	0	0	2	0	0	1	0	0	S.
3.8	5.3	4.0	4.4	3,805	26	SW.	SW.	1	0	3	13	21	39	13	2	1	11	15	5	0	16	0	0	0	0	1	O.
4.3	5.8	3.6	4.6	3,693	24	SW.	SW.	1	3	1	11	25	39	8	1	1	10	14	6	0	6	1	16	0	0	0	N.
6.3	8.1	5.7	6.7	4,622	26	SW.	SW.	2	2	3	5	15	57	4	1	4	2	18	11	0	17	3	11	0	0	0	D.
4.2	4.8	4.1	4.4	55,330	...	....	SW.	22	31	29	116	265	418	158	45	11	142	148	75	1	101	16	62	39	5	4	Y.

WASHINGTON, D. C.

[H=106. T=58. h=51.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.5	5.8	5.6	6.0	4,708	28	S.	N.	28	6	8	6	6	3	7	26	3	5	17	9	0	15	9	24	0	0	0	J.
4.6	4.7	3.8	4.4	5,313	38	NW.	NW.	10	10	4	2	17	8	4	25	4	8	16	4	0	7	4	20	0	0	0	F.
5.0	4.8	3.8	4.5	6,299	30	NW.	NW.	21	5	7	3	21	7	3	24	2	11	12	8	0	10	1	11	0	0	0	M.
5.9	5.9	5.2	5.7	4,281	30	NW.	E., S.	4	15	21	3	21	9	2	9	6	8	11	11	0	9	0	0	0	4	0	A.
6.2	6.2	5.3	5.9	4,110	24	W.	S.	13	12	7	4	27	9	0	17	4	9	10	12	0	18	0	0	0	10	1	M.
5.7	6.7	4.3	5.6	3,701	19	NW.	S.	9	17	7	5	19	13	4	13	3	6	17	7	0	11	0	0	0	4	0	J.
5.4	5.6	4.1	5.0	3,338	18	NE.	S.	12	12	7	9	19	11	7	14	2	7	18	6	0	12	0	0	2	11	0	J.
5.6	5.5	2.5	4.5	3,371	16	NW., S.	S.	9	13	7	12	15	13	10	12	2	13	12	6	0	9	0	0	2	1	0	A.
6.4	4.9	3.7	5.0	3,364	21	NW.	NE.	11	20	5	3	17	18	2	11	3	5	20	5	0	8	0	0	1	1	0	S.
3.6	3.5	3.2	3.4	3,602	24	NW.	NW.	13	13	7	3	18	5	5	23	6	19	6	6	0	8	0	0	0	0	0	O.
4.6	5.3	4.6	4.8	4,502	29	NW.	NW.	5	8	3	0	18	15	5	29	7	11	11	8	0	9	0	6	0	0	0	N.
6.6	5.6	4.5	5.6	4,148	26	NW.	N.	29	9	3	1	15	3	6	17	10	9	10	12	1	13	7	25	0	0	0	D.
5.5	5.4	4.2	5.0	50,737	...	....	NW.	164	140	86	51	213	114	55	220	52	111	160	94	1	129	21	86	5	31	1	Y.

WILMINGTON, N. C.

[H=52. T=60. h=44.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
8.1	5.7	5.4	6.4	4,811	25	W.	NW.	16	15	9	4	5	8	15	18	3	4	13	14	0	12	1	9	0	0	0	J.
4.9	3.2	2.6	3.6	4,655	30	SW.	SW.	10	11	5	6	4	18	9	12	9	15	9	4	0	8	1	12	0	1	0	F.
4.7	5.6	2.4	4.2	5,871	30	W.	SW.	11	6	3	2	10	24	14	13	10	12	14	5	0	11	0	5	0	2	0	M.
4.6	4.9	2.8	4.1	5,520	25	E.	SW.	5	9	15	16	8	21	10	3	2	11	13	5	0	8	0	0	0	1	0	A.
5.0	4.4	3.0	4.1	5,767	30	SW.	SW.	6	4	2	12	7	41	10	11	0	11	16	4	0	10	0	0	2	5	0	M.
6.4	6.5	5.5	6.1	4,776	24	W.	SW.	4	15	5	12	3	31	13	4	3	5	13	12	0	16	0	0	1	7	0	J.
5.2	5.6	4.6	5.1	4,320	30	NE.	SW.	3	4	5	10	11	43	12	2	3	8	15	8	0	17	0	0	6	10	0	J.
6.2	6.4	4.6	5.7	4,517	20	W.	SW.	5	12	8	11	7	26	9	8	7	7	14	10	0	16	0	0	7	4	0	A.
4.2	4.0	3.4	3.9	3,930	20	E.	NE.	3	27	8	19	7	16	3	5	2	12	15	3	0	7	0	0	3	1	0	S.
2.8	2.7	2.2	2.6	3,879	16	NE., E.	NE.	11	25	16	8	4	8	3	13	5	19	10	2	0	2	0	0	0	0	0	O.
4.0	3.7	1.8	3.2	4,626	34	SW.	SW.	8	5	4	6	6	19	11	17	14	15	12	3	0	4	0	3	0	0	0	N.
5.5	5.4	3.9	4.9	4,233	25	SW.	NE.	9	17	8	4	5	10	11	16	13	12	8	11	0	12	0	10	0	0	0	D.
5.1	4.8	3.5	4.5	56,905	...	....	SW.	91	150	88	110	77	265	120	122	71	131	152	81	0	123	2	39	19	31	0	Y.

Monthly and yearly meteorological summaries—Continued.

WINNEMUCCA, NEV.

[Latitude, 40° 58′ N.; longitude, 117° 43′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temperature. 7 a. m.	Temperature. 3 p. m.	Temperature. 11 p. m.	Temperature. Mean.	Temperature. Maximum.	Temperature. Minimum.	Temperature. Mean. Maximum.	Temperature. Mean. Minimum.	Dew Point. 7 a. m.	Dew Point. 3 p. m.	Dew Point. 11 p. m.	Dew Point. Mean.	Relative humidity. 7 a. m.	Relative humidity. 3 p. m.	Relative humidity. 11 p. m.	Relative humidity. Mean.	Precipitation. Total.	Precipitation. Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J..	25.621	26.01	24.96	26.0	38.7	32.1	32.3	57	2	42.2	21.4	17	18	20	18	70	44	60	58	.71	.22
F..	25.711	26.05	25.17	32.4	49.2	39.2	40.3	67	11	54.4	27.5	24	22	22	23	69	37	52	53	.40	.20
M..	25.591	25.93	25.16	28.5	44.8	36.0	36.4	68	16	48.6	24.4	18	14	19	17	65	32	51	50	.82	.32
A..	25.534	25.91	25.17	34.9	53.1	43.9	44.0	72	20	57.2	32.3	24	19	22	22	65	30	46	47	1.37	.27
M..	25.623	25.88	25.42	42.5	69.1	58.6	56.7	88	20	73.4	38.8	22	20	22	21	46	16	26	29	.14	.12
J..	25.599	25.78	25.41	50.0	76.3	66.2	64.2	95	35	80.7	47.9	29	30	31	30	48	21	29	33	.76	.68
J..	25.605	25.77	25.41	56.8	84.5	73.3	71.5	100	39	89.0	54.8	31	34	32	32	41	18	25	28	.61	.37
A..	25.593	25.72	25.39	56.9	85.9	74.2	72.3	97	43	90.3	53.2	25	27	26	26	30	12	18	20	(†)	(†)
S..	25.644	25.83	25.43	44.0	75.4	59.9	59.8	91	27	79.7	39.9	17	18	17	18	35	13	20	22	.00	.00
O..	25.645	25.91	25.38	35.4	54.1	43.0	44.2	77	17	58.6	32.3	27	29	28	28	73	44	58	58	1.72	.60
N..	25.780	26.10	25.00	22.3	39.8	29.5	30.5	59	1	44.5	18.8	15	20	19	18	72	46	64	61	.80	.53
D..	25.726	26.09	25.40	31.9	43.2	36.3	37.1	61	16	47.6	28.6	24	26	26	25	73	53	68	64	.83	.38
Y..	25.639	26.10	24.96	38.5	59.5	49.3	49.1	100	1	63.8	35.0	23	23	24	23	57	31	43	44	8.16	....

YANKTON, DAK.

[Latitude, 42° 54′ N.; longitude, 97° 28′ W.]

J...	28.823	29.26	28.27	0.9	10.4	3.8	5.0	42	-27	14.5	- 4.8	- 3	6	1	1	85	82	86	84	.43	.20
F..	28.726	29.22	28.09	16.4	29.8	22.4	22.9	65	-24	34.4	11.8	13	20	18	17	84	69	83	79	.57	.23
M..	28.677	29.10	28.10	23.2	33.1	28.0	28.1	58	- 6	36.5	20.7	19	24	24	22	83	74	84	80	3.38	.91
A..	28.627	29.09	28.12	39.6	55.3	47.9	47.6	80	3	59.8	38.2	36	41	41	39	86	64	78	76	5.12	2.43
M..	28.642	28.95	28.21	52.6	72.4	61.8	62.3	94	38	75.6	51.3	49	54	55	53	87	54	78	73	3.39	2.08
J..	28.659	29.03	28.23	59.2	77.4	66.8	67.8	90	44	80.2	57.2	56	58	60	58	89	52	80	74	3.07	1.03
J...	28.635	28.88	28.44	66.5	86.1	75.5	76.0	102	56	89.7	65.0	61	63	64	63	84	47	70	67	.69	.51
A..	28.630	28.87	28.35	64.4	82.6	71.9	73.0	99	40	85.6	63.2	61	66	66	64	89	59	82	76	5.40	3.46
S..	28.630	28.92	28.16	54.6	70.8	60.2	61.9	91	33	74.4	52.3	50	51	51	51	84	54	73	71	3.45	1.64
O..	28.723	29.28	28.28	45.4	66.6	53.9	55.3	82	19	69.7	42.3	40	45	43	43	82	48	67	66	.31	.29
N..	28.678	29.13	27.90	25.3	38.7	28.2	30.7	70	(*)	41.0	20.7	19	25	19	21	77	62	70	70	2.44	1.16
D..	28.809	29.44	28.31	10.5	18.2	13.4	14.0	49	-22	23.9	4.4	5	10	8	8	78	72	79	76	.90	.35
Y..	28.688	29.44	27.90	38.2	53.4	44.5	45.4	102	-27	57.1	35.2	34	39	38	37	84	61	78	74	29.15	....

YUMA, ARIZ.

[Latitude, 32° 45′ N.; longitude, 114° 36′ W.]

J...	29.919	30.28	29.56	48.8	61.7	54.6	55.0	80	30	64.9	45.8	40	38	41	40	74	48	63	62	1.06	.45
F..	29.874	30.22	29.56	53.1	72.5	62.6	62.7	83	44	76.2	50.2	39	35	38	38	63	28	43	45	.08	.05
M..	29.833	30.06	29.57	50.2	70.2	61.2	60.5	88	38	74.1	47.2	41	37	39	39	73	32	47	50	.33	.23
A..	29.737	30.00	29.45	56.0	78.4	67.9	67.4	93	45	82.1	53.8	46	45	45	46	72	32	45	49	.31	.31
M..	29.719	29.91	29.56	66.8	92.5	80.9	80.1	108	54	97.0	64.8	53	49	52	51	64	25	39	42	.00	.00
J...	29.624	29.81	29.33	70.6	96.7	84.6	84.0	109	64	102.1	69.5	61	58	61	60	74	29	46	50	.00	.00
J...	29.616	29.81	29.45	78.6	102.5	91.4	90.8	112	69	106.7	77.2	67	62	65	65	69	28	43	47	(†)	(†)
A..	29.642	29.84	29.44	82.0	97.4	89.5	89.6	112	75	102.2	79.5	74	71	73	73	79	46	60	62	2.23	1.57
S..	29.634	29.77	29.49	73.2	95.4	83.9	84.2	104	62	98.7	70.7	62	58	61	60	70	30	47	49	.00	.00
O..	29.812	30.02	29.62	58.1	77.9	66.1	67.4	93	47	81.3	55.2	48	45	48	47	71	33	54	53	1.11	1.08
N..	29.953	30.22	29.55	50.0	67.0	56.5	57.8	81	32	69.7	46.6	32	30	34	32	56	27	45	43	.23	.23
D..	29.942	30.13	29.74	51.4	68.8	57.6	59.3	79	34	72.5	47.3	36	39	39	38	58	35	50	48	.00	.00
Y..	29.776	30.28	29.33	61.6	81.8	71.4	71.6	112	30	85.6	59.0	50	47	50	49	68	33	48	50	5.35	....

* Zero. † Inappreciable.

Monthly and yearly meteorological summaries—Continued.

WINNEMUCCA, NEV.

[H=4,358. T=16. h=5.]

Cloudiness (in tenths.)				Wind.													Number of days—										
7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles.)	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.7	4.6	4.4	4.6	7,195	41	SW.	SW.	3	22	8	0	3	46	6	4	1	12	12	7	0	11	5	22	0	0	0	J.
2.8	3.0	1.6	2.5	5,248	36	SW.	SW.	7	23	7	2	3	32	5	2	3	19	7	2	0	6	0	22	0	0	0	F.
3.5	6.2	3.0	4.2	6,779	40	SW.	SW.	7	21	8	1	5	37	7	6	1	9	18	4	0	11	0	28	0	0	0	M.
3.9	4.7	3.4	4.0	7,318	42	W.	SW.	5	24	3	2	5	40	5	4	2	13	11	6	0	11	0	16	0	0	0	A.
1.7	4.0	2.4	2.7	6,240	35	SW.	SW.	5	17	8	2	7	42	7	4	1	17	13	1	0	2	0	6	0	1	0	M.
1.2	2.0	1.6	1.6	5,761	31	E.	SW.	11	14	11	1	1	43	7	2	0	22	7	1	0	2	0	0	2	3	0	J.
1.8	1.3	2.5	1.9	5,141	31	E.	SW.	3	15	14	2	6	34	9	10	0	22	9	0	0	3	0	0	10	4	0	J.
.8	1.5	1.7	1.3	4,745	25	W.	SW.	3	10	12	0	5	53	6	4	0	24	6	1	0	0	0	0	21	2	1	A.
.2	.8	1.0	.7	4,735	27	NE.	NE.	3	35	7	0	4	33	5	2	1	27	2	1	0	0	0	3	3	0	0	S.
3.9	5.6	3.5	4.3	4,750	34	SW.	SW.	1	33	2	1	7	43	5	0	1	10	17	4	0	9	0	13	0	0	0	O.
2.4	3.0	1.8	2.4	5,372	25	SW.	NE.	1	35	9	0	2	34	3	4	2	18	11	1	0	6	2	30	0	0	0	N.
4.6	5.5	5.3	5.1	6,436	29	SW.	SW.	3	32	5	1	1	45	3	2	1	8	16	7	0	8	0	22	0	0	0	D.
2.6	3.5	2.7	2.9	69,723	..	....	SW.	52	281	94	12	49	482	68	44	13	201	129	35	0	69	7	162	36	10	1	Y.

YANKTON, DAK.

[H=1,234. T=35. h=26.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles.)	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.1	6.9	3.9	5.3	6,891	39	NW.	NW.	14	2	2	9	9	5	3	39	10	8	15	8	0	9	28	31	0	0	1	J.
3.2	5.2	3.2	3.9	6,989	36	NW.	NW.	13	4	7	9	5	11	9	23	3	12	12	4	0	8	11	25	0	0	0	F.
5.6	5.9	5.6	5.7	6,613	38	NW.	NW.	9	11	8	8	10	3	12	26	6	9	10	12	0	10	13	26	0	0	1	M.
5.2	6.4	3.4	5.0	7.908	39	SW.	NW.	1	5	8	19	9	9	8	26	5	10	13	7	0	8	1	7	0	2	0	A.
5.0	4.0	3.5	4.2	4,705	32	NE., E.	N.	16	14	14	11	12	7	6	10	3	8	22	1	0	13	0	0	1	9	1	M.
4.4	5.1	2.0	3.8	4,799	30	S.	N.	19	10	7	10	13	12	5	9	5	12	15	3	0	7	0	0	1	5	0	J.
4.4	3.7	3.1	3.7	5,272	30	S.	S.	3	12	14	16	23	12	5	5	3	12	17	2	0	3	0	0	15	4	1	J.
4.4	4.6	3.8	4.3	4,318	32	S.	S.	6	15	12	11	23	9	3	11	3	10	17	4	0	9	0	0	12	6	0	A.
4.8	4.3	3.0	4.0	6,184	32	S., NW.	S.	14	5	8	6	21	7	7	20	2	14	10	6	0	11	0	0	3	2	0	S.
3.0	4.3	3.1	3.5	6,414	37	S.	S.	5	1	5	16	38	8	5	13	2	16	10	5	0	2	0	7	0	1	1	O.
4.7	5.5	3.0	4.4	7,155	37	N.	NW.	14	4	8	6	12	9	12	23	2	11	13	6	0	9	7	25	0	1	1	N.
4.0	6.4	4.5	5.0	5,882	36	N.	NW.	17	5	9	10	13	7	5	26	1	9	13	9	0	11	20	30	0	0	0	D.
4.5	5.2	3.5	4.4	73,130	...	....	NW.	131	88	102	131	188	99	80	231	45	131	167	67	0	100	80	151	32	30	6	Y.

YUMA, ARIZ.

[H=141. T=5. h=22.]

7 a. m.	3 p. m.	11 p. m.	Mean.	Total (miles.)	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.4	4.5	3.8	3.9	4,647	30	S.	N.	39	8	5	2	9	3	9	3	15	15	9	7	0	5	0	3	0	0	0	J.
1.9	3.4	1.8	2.4	3,779	26	N.	N.	26	13	9	2	9	3	7	1	14	16	11	1	0	2	0	0	0	1	0	F.
1.8	2.8	1.4	2.0	5,251	36	W.	W.	12	12	13	3	15	8	18	10	2	22	7	2	0	3	0	0	0	0	0	M.
.2	1.2	.4	.6	5,765	44	W.	S.	9	6	2	3	25	9	19	12	5	27	3	0	0	1	0	0	4	0	0	A.
3.8	2.9	1.9	2.9	4,885	32	W.	W.	7	4	8	1	9	16	38	6	4	18	9	4	0	0	0	0	24	0	0	M.
.1	.2	.1	.1	4,417	24	S.	SW.	6	4	5	7	22	27	11	4	4	30	0	0	0	0	0	0	30	0	0	J.
1.6	1.2	2.1	1.6	4,803	32	S., E.	S.	3	4	11	4	26	23	13	2	7	21	9	1	0	0	0	0	31	7	0	J.
3.9	3.8	2.9	3.5	4,778	34	SE.	S.	1	11	3	7	37	18	5	5	6	16	9	6	0	4	0	0	30	11	0	A.
.1	.2	.1	.1	2,969	19	S.	NE.	3	30	5	1	17	15	7	3	9	30	0	0	0	0	0	0	30	1	0	S.
.3	1.1	.6	.7	3,707	30	E.	NE.	7	24	10	7	8	2	12	12	11	27	4	0	0	2	0	0	4	2	0	O.
2.0	1.4	1.3	1.6	5,300	38	N.	N.	41	11	9	2	12	5	5	5	0	23	7	0	0	1	0	1	0	0	0	N.
.6	1.6	.9	1.0	4,025	23	NW.	N.	36	20	16	0	5	1	7	8	0	28	3	0	0	0	0	0	0	0	0	D.
1.6	2.0	1.4	1.7	54,326	...	....	S.	190	147	96	39	194	130	151	71	77	273	71	21	0	18	0	4	153	22	0	Y.

APPENDIX No. 17.

Mean monthly temperatures and departure of 1886 *therefrom (in degrees Fahrenheit) at stations of the Signal Service, U. S. Army. (This normal has been computed from the commencement of observations at each station to December,* 1886, *inclusive.)*

[The daily means are obtained by dividing the sum of the tri-daily observations by 3; the monthly by dividing the sum of the daily by the number of days in the month. Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time); and from January 1, 1885, to December 31, 1886, at 7 a. m., 3 and 11 p. m. (75th meridian time).]

Districts and stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Abilene, Tex	34.9	± 0.0	48.0	± 0.0	53.4	± 0.0	61.5	± 0.0	77.2	± 0.0	78.9	± 0.0	84.0	± 0.0	82.1	± 0.0	74.3	± 0.0	63.7	+ 1.2	54.0	— 2.1	46.8	— 2.7
Albany, N. Y	22.8	— 2.4	24.8	— 2.2	32.1	+ 0.5	45.6	+ 4.8	59.1	± 0.0	68.3	— 2.5	72.4	— 0.2	70.6	— 0.3	63.1	+ 0.3	51.8	+ 0.9	39.1	+ 0.6	28.3	— 4.7
Alpena, Mich	17.6	— 2.3	17.8	— 1.8	23.6	+ 2.3	36.2	+ 1.9	48.8	+ 0.8	59.4	— 0.9	65.3	— 0.9	63.9	— 1.1	56.8	— 0.8	45.4	+ 2.7	32.3	— 0.3	23.3	— 3.4
Apache, Fort, Ariz	33.7	+ 1.1	39.0	+ 3.7	44.7	— 2.6	50.3	— 0.3	58.0	+ 5.3	66.9	+ 2.2	72.5	+ 1.3	70.0	+ 1.8	63.4	+ 0.6	53.6	+ 0.4	41.5	— 2.0	37.0	+ 3.3
Assinaboine, Fort, Mont	9.0	— 8.6	16.9	+13.4	30.4	— 1.7	42.8	+ 3.4	53.4	+ 3.3	64.0	+ 1.4	67.4	+ 6.7	65.7	+ 2.4	53.8	— 0.4	42.1	+ 3.8	30.4	— 0.7	19.5	— 0.6
Atlanta, Ga	42.6	— 6.5	46.9	— 5.0	52.4	— 2.3	60.8	— 0.4	68.7	— 0.6	75.1	— 2.8	78.3	— 2.5	75.6	+ 0.5	71.5	+ 1.4	63.0	— 0.7	51.2	— 0.6	44.5	— 3.8
Atlantic City, N. J	36.7	— 2.0	33.1	— 3.2	37.9	+ 0.2	46.5	+ 1.5	57.0	— 1.0	66.7	— 1.0	72.3	— 0.2	72.0	— 0.6	67.2	+ 1.3	57.1	+ 1.0	44.6	+ 2.1	35.6	— 2.4
Augusta, Ga	46.8	— 6.6	50.2	— 5.5	55.7	— 1.5	63.7	— 0.6	72.4	— 0.2	78.5	— 3.1	81.7	— 3.8	79.5	— 1.9	74.8	— 0.1	64.3	— 2.6	53.6	— 1.7	47.3	— 4.7
Baltimore, Md	34.1	— 5.0	36.6	— 5.3	41.8	— 0.2	53.1	+ 1.5	64.3	— 2.4	73.6	— 3.7	78.1	— 3.7	75.1	— 1.6	68.1	+ 1.5	57.8	+ 0.8	45.3	+ 1.1	36.7	— 5.4
Behring's Island, Behring Sea[2]	26.4	+ 1.0	27.6	— 0.6	27.0	+ 0.2	29.4	+ 1.3	35.7	([1])	42.1	([1])	47.1	([1])	51.0	([1])	46.8	([1])	37.2	([1])	30.3	([1])	27.3	([1])
Benton, Fort, Mont.[3]	12.4	— 8.9	21.0	+12.9	31.0	— 0.5	43.4	+ 3.0	55.2	+ 2.4	63.4	+ 2.4	69.7	+ 6.0	68.2	+ 1.6	56.0	— 2.1	44.5	([1])	28.8	([1])	21.3	([1])
Bidwell, Fort, Cal	30.1	± 0.0	40.2	± 0.0	35.3	± 0.0	41.8	± 0.0	53.6	± 0.0	61.2	± 0.0	68.6	— 0.4	69.6	± 0.0	58.4	+ 1.8	48.6	— 4.0	36.1	— 2.5	36.9	+ 1.5
Bismarck, Dak	4.5	— 8.6	11.1	+ 4.7	22.2	+ 2.0	40.6	+ 4.2	55.2	+ 3.5	63.8	+ 1.5	68.8	+ 6.4	67.5	+ 2.1	55.8	— 1.5	43.6	+ 3.7	25.5	— 0.7	18.4	— 9.2
Block Island, R. I	30.4	— 0.2	31.0	— 2.6	34.6	— 0.4	43.5	+ 1.7	52.0	+ 1.5	62.3	— 1.0	68.9	— 0.2	68.2	— 1.0	64.2	+ 0.6	55.1	— 0.3	45.4	+ 1.2	35.9	— 1.9
Boisé City, Idaho	28.4	— 0.2	34.6	+ 5.3	43.2	— 3.2	49.9	— 2.4	57.3	+ 1.8	66.1	+ 0.8	72.9	+ 2.1	72.2	+ 1.5	59.9	— 0.8	48.3	+ 0.6	38.3	— 4.9	32.7	+ 5.0
Boston, Mass	26.2	— 0.3	27.7	— 1.1	33.8	— 0.1	44.3	+ 3.4	56.1	+ 0.1	66.0	— 2.9	71.3	— 0.5	69.2	— 1.5	62.2	+ 0.5	52.0	— 0.5	39.8	+ 3.0	30.1	— 1.3
Bridger, Fort, Wyo	21.0	± 0.0	29.2	± 0.0	24.6	± 0.0	36.2	± 0.0	49.1	± 0.0	54.6	± 0.0	63.7	± 0.0	60.6	+ 1.9	51.5	— 0.3	41.8	— 2.2	28.2	— 4.0	27.7	+ 2.3
Brownsville, Tex	57.2	— 3.9	61.8	— 0.6	68.4	— 2.3	74.1	— 2.8	78.6	— 3.1	82.6	— 2.6	83.7	— 3.6	82.7	— 1.6	79.5	— 1.6	75.0	— 1.9	65.7	— 0.2	60.7	+ 0.5
Buffalo, N. Y	24.2	— 2.1	24.6	— 1.2	30.0	+ 1.0	41.5	+ 4.8	53.6	— 0.5	64.4	— 0.7	69.6	— 1.1	68.9	— 1.4	62.1	+ 0.6	50.9	+ 1.1	37.6	— 0.3	28.9	— 5.3
Bufort, Fort, Dak	4.6	— 8.8	9.7	+ 7.7	23.6	+ 2.6	41.4	+ 2.9	54.2	+ 2.4	64.0	+ 1.9	68.0	+ 7.6	66.3	+ 2.3	54.0	— 1.1	42.5	+ 2.3	26.1	— 0.8	9.9	— 2.4
Cairo, Ill	34.4	— 9.0	39.8	— 4.7	47.0	— 2.8	58.4	— 0.4	67.9	+ 0.8	75.1	— 3.2	79.4	— 1.8	77.6	— 0.8	69.6	+ 1.[illegible]	59.6	— 0.1	46.1	— 0.8	37.8	— 7.1
Canby, Fort, Wash	41.5	— 1.4	43.5	+ 3.1	45.9	— 1.8	49.2	— 1.1	52.7	— 0.6	55.7	+ 0.4	59.3	— 0.3	59.3	+ 0.2	58.0	+ 0.3	52.8	— 0.4	48.3	— 2.7	43.8	+ 3.7
Cape Henry, Va.[4]	40.1	— 5.6	42.0	— 5.4	46.2	— 1.6	53.9	— 0.4	63.9	— 0.8	73.0	— 2.9	77.7	— 2.5	76.1	— 2.0	72.0	± 0.0	62.9	— 0.4	51.8	+ 0.9	43.5	— 4.8
Cape Mendocino, Cal.[4]	47.7	+ 0.3	47.2	+ 3.1	48.3	— 2.2	48.5	— 1.0	51.2	+ 0.1	54.2	— 0.2	54.9	+ 0.5	55.0	+ 1.6	57.3	— 0.1	54.1	— 1.1	51.6	— 0.3	50.0	+ 0.8
Cedar Keys, Fla	56.6	— 7.4	60.1	— 6.1	62.9	— 3.7	69.7	— 3.9	75.5	— 1.5	80.7	— 0.3	82.3	— 2.0	81.6	— 0.8	79.6	— 0.2	72.9	— 1.7	62.6	— 2.8	58.2	— 3.8
Charleston, S. C	49.0	— 6.2	52.4	— 4.8	57.3	— 3.4	64.2	— 1.8	72.7	+ 0.1	79.4	— 2.1	82.6	— 2.7	80.5	— 2.3	76.1	± 0.0	67.0	— 0.5	57.3	— 0.2	50.9	— 2.5
Charlotte, N. C	40.6	— 5.3	45.1	— 5.0	50.0	— 1.5	59.0	+ 0.7	68.7	— 0.4	75.4	— 3.3	78.8	— 2.5	76.2	— 1.1	71.2	+ 1.2	62.4	— 2.0	49.7	+ 0.8	42.6	— 3.6
Chattanooga, Tenn	40.7	— 7.5	44.6	— 5.7	50.8	— 1.5	59.8	+ 0.3	68.0	— 0.6	74.7	— 2.9	77.7	— 3.2	75.5	± 0.0	70.4	+ 0.6	62.3	— 2.0	49.2	— 1.2	42.5	— 4.7

Cheyenne, Wyo	24.7	− 3.1	28.0	+ 5.4	33.0	− 3.4	39.5	− 1.1	50.8	+ 4.4	61.1	− 1.8	67.1	+ 2.1	65.0	+ 1.3	55.5	+ 0.3	44.5	+ 3.3	33.7	(5)	27.3	(5)
Chicago, Ill	24.5	− 3.1	28.1	± 0.0	34.9	+ 1.2	45.9	+ 3.2	56.6	+ 0.4	65.6	+ 0.4	72.2	− 0.8	71.5	+ 0.9	64.1	+ 2.0	52.9	+ 3.7	38.5	− 0.3	28.7	− 3.7
Chincoteague, Va	33.9	− 1.2	37.0	− 3.4	40.5	+ 0.9	49.9	+ 2.0	60.0	− 0.4	69.4	− 0.5	74.7	− 0.2	73.4	− 0.2	70.1	+ 0.9	60.9	+ 0.1	48.3	+ 1.7	38.8	− 2.4
Cincinnati, Ohio	32.9	− 7.5	36.7	− 6.6	42.9	− 1.4	54.4	+ 0.9	65.3	− 0.1	73.6	− 3.9	77.9	− 3.4	75.4	− 1.5	68.1	+ 0.3	57.4	− 1.2	44.2	− 2.6	36.1	− 7.4
Cleveland, Ohio	25.8	− 2.7	27.6	− 2.2	33.5	+ 1.4	45.3	+ 3.8	58.0	− 0.6	67.4	− 1.9	71.6	− 1.7	70.0	− 0.5	63.6	+ 1.2	53.1	+ 0.8	39.2	− 0.3	29.7	− 4.4
Columbus, Ohio	27.5	− 3.7	31.9	− 4.4	38.2	+ 0.4	50.6	+ 3.8	62.8	+ 0.1	70.3	− 2.7	75.2	− 2.8	72.1	− 0.6	65.9	− 0.2	55.6	− 1.3	41.1	− 2.2	31.7	− 5.0
Concordia, Kans	10.5	± 0.0	30.7	± 0.0	35.0	± 0.0	51.0	± 0.0	62.2	+ 4.0	70.2	− 0.3	75.6	+ 1.0	73.5	+ 2.4	67.2	+ 1.5	55.3	+ 4.4	39.6	− 2.3	28.8	− 4.6
Custer, Fort, Mont	14.4	−12.2	22.4	+ 7.8	33.0	− 1.7	44.7	+ 1.4	55.2	+ 3.1	64.2	+ 1.4	70.9	+ 4.7	69.7	+ 2.1	57.4	− 1.4	46.2	+ 0.4	32.4	− 1.4	20.7	+ 3.4
Davenport, Iowa	20.9	− 7.6	26.7	− 3.6	35.1	− 2.1	49.3	+ 2.7	61.4	+ 1.0	70.3	− 0.1	75.1	+ 1.2	73.0	+ 1.4	64.3	+ 1.2	52.8	+ 2.9	37.2	− 2.1	26.6	− 9.1
Davis, Fort, Tex	43.2	− 0.4	48.2	− 0.9	54.1	− 1.5	60.6	− 0.8	68.6	+ 4.2	74.7	− 1.1	75.6	+ 0.5	72.1	+ 3.4	67.3	+ 1.1	61.2	+ 2.1	50.5	− 1.1	45.6	+ 4.3
Deadwood, Dak	21.0	− 6.3	24.5	+ 6.5	31.6	− 2.0	39.9	+ 1.4	49.8	+ 4.9	60.0	− 0.4	65.1	+ 5.8	65.0	+ 1.8	53.6	+ 0.1	44.2	+ 3.5	32.8	− 3.5	23.2	+ 1.6
Denver, Colo	27.2	− 6.4	32.4	+ 6.2	39.3	− 5.8	45.9	− 1.7	56.5	+ 4.5	66.5	− 1.2	72.2	+ 1.7	70.2	+ 0.8	61.1	− 0.7	50.4	+ 2.1	37.6	− 4.4	31.0	+ 6.1
Des Moines, Iowa	17.9	− 7.0	24.2	+ 0.5	35.0	− 0.1	49.6	+ 3.1	61.4	+ 3.0	69.7	+ 1.6	74.4	+ 4.0	73.0	+ 3.8	63.9	+ 1.2	53.3	+ 4.0	37.3	− 1.5	23.7	− 4.5
Detroit, Mich	24.5	+ 0.2	26.7	+ 1.3	32.8	+ 2.8	45.1	+ 5.5	57.8	+ 0.6	67.3	− 0.5	71.7	− 0.7	70.0	+ 0.2	62.9	+ 1.9	52.1	+ 2.7	38.0	+ 0.5	28.7	− 4.7
Dodge City, Kans	25.1	− 8.6	32.8	+ 2.2	41.7	− 2.7	52.8	− 1.8	63.0	+ 4.5	72.7	− 1.5	77.3	+ 0.9	75.1	+ 3.2	67.2	+ 0.4	55.2	+ 3.6	39.2	− 1.1	30.9	− 2.3
Dubuque, Iowa	18.2	− 5.5	23.9	− 2.1	33.0	− 1.7	48.0	+ 3.0	60.7	+ 0.4	68.4	± 0.0	74.2	+ 1.0	71.8	+ 2.3	62.7	+ 0.9	51.5	+ 3.3	35.2	− 2.0	24.7	− 9.0
Duluth, Minn	10.3	− 4.6	15.9	− 3.5	24.0	− 0.1	38.0	− 1.3	48.9	+ 3.3	58.2	− 0.6	66.4	− 0.3	65.4	− 1.5	55.8	− 5.2	45.0	+ 1.9	29.1	− 1.3	16.1	− 7.2
Eastport, Me	19.8	+ 3.1	22.2	− 1.3	28.1	± 0.0	38.2	+ 1.9	47.3	− 0.3	55.3	− 0.4	60.5	+ 0.3	60.6	− 1.4	55.6	− 0.7	47.0	− 1.2	35.9	+ 2.4	25.2	− 0.5
Elliott, Fort, Tex	30.2	− 5.0	35.6	+ 4.3	45.4	− 1.2	55.4	− 1.5	63.5	+ 6.2	72.9	− 0.7	76.6	+ 2.4	74.5	+ 2.7	67.9	(5)	57.0	+ 1.8	42.2	+ 0.6	34.6	− 0.6
El Paso, Tex	44.4	− 0.9	50.2	+ 0.4	56.2	− 3.3	63.0	− 0.5	72.5	+ 4.3	80.4	− 1.5	82.1	+ 0.3	79.1	+ 1.2	72.4	− 0.5	63.4	− 0.6	50.7	− 2.6	46.5	+ 1.2
Erie, Pa	26.9	− 3.8	27.7	− 3.8	32.8	− 1.1	44.0	+ 2.9	57.3	− 1.5	67.1	− 3.0	71.7	− 3.5	70.0	− 1.6	64.0	+ 0.2	53.3	± 0.0	40.4	− 1.5	32.0	− 6.2
Escanaba, Mich	13.9	− 1.1	15.5	− 1.0	22.0	+ 2.4	35.8	+ 2.2	49.3	+ 0.7	60.5	− 0.5	66.5	− 1.0	64.6	− 1.8	56.3	− 1.3	45.2	+ 3.0	31.2	− 1.1	20.4	− 5.4
Fort Smith, Ark	30.8	− 3.7	39.0	− 0.5	49.2	− 1.7	60.1	− 0.4	68.6	+ 4.2	75.9	− 2.1	79.7	− 0.1	77.3	+ 1.7	72.5	+ 1.3	62.4	− 1.2	50.5	− 3.1	39.7	− 3.6
Frisco, Utah	28.7	± 0.0	38.6	± 0.0	31.2	± 0.0	41.6	± 0.0	59.3	± 0.0	66.9	± 0.0	73.5	+ 1.0	70.4	− 0.1	63.2	− 0.3	50.6	− 3.5	35.8	− 3.6	37.0	+ 2.0
Galveston, Tex	52.2	− 4.9	56.8	− 3.3	63.3	− 4.3	69.3	− 2.8	76.3	− 1.7	82.4	− 2.1	84.4	− 1.6	83.6	− 0.4	79.7	+ 0.4	72.5	− 0.9	62.1	− 0.1	56.5	− 0.3
Grand Haven, Mich	24.5	− 4.3	25.3	− 2.2	30.7	− 0.3	43.7	+ 3.6	55.1	− 2.8	64.2	− 3.2	69.0	− 3.1	67.7	− 0.6	60.9	+ 0.7	50.4	+ 1.9	37.3	− 1.9	28.7	− 6.2
Grant, Fort, Ariz	42.2	− 1.2	46.2	+ 3.6	51.4	− 3.9	57.4	− 2.1	66.7	+ 1.2	75.6	(1)	77.8	(1)	74.8	+ 0.3	71.0	− 1.6	62.0	− 0.8	50.3	− 2.0	46.0	+ 4.8
Greencastle, Ind.[6]	21.4	+ 0.5	24.5	+ 4.9	36.4	+ 3.5	52.8	+ 1.7	61.8	+ 1.6	68.2	+ 0.3	74.4	− 0.8	71.0	+ 1.8	64.8	+ 1.4	55.0	+ 1.4	41.6	(1)	30.2	(1)
Hatteras, N. C	43.4	− 3.6	46.4	− 4.5	48.8	− 0.2	56.4	+ 2.5	66.1	+ 0.1	73.9	− 0.4	78.2	− 0.5	77.2	− 1.7	74.6	− 0.1	66.6	− 1.3	55.9	± 0.0	47.0	− 1.9
Helena, Mont	15.2	− 5.1	23.6	+10.9	33.9	− 4.8	42.2	+ 0.7	52.0	+ 2.9	60.5	+ 0.6	66.8	+ 3.1	66.9	+ 1.2	55.5	− 2.6	43.1	+ 0.2	30.9	− 1.5	22.9	+ 4.2
Huron, Dak	6.7	− 6.4	13.8	+ 4.9	28.0	− 1.4	44.5	+ 1.6	54.6	+ 5.0	66.0	− 0.7	69.7	+ 4.7	68.1	+ 1.9	56.6	+ 2.1	46.8	+ 3.9	29.8	− 2.8	17.2	− 8.8
Indianapolis, Ind	28.4	− 6.2	32.5	− 4.3	39.8	− 0.4	52.6	+ 2.0	63.9	+ 0.4	72.2	− 3.0	76.3	− 2.0	73.7	− 0.8	65.8	+ 0.8	55.1	+ 0.2	40.7	− 1.4	32.0	− 6.8
Indianola, Tex.[7]	51.9	− 5.6	57.4	− 1.5	64.5	− 3.6	69.8	− 2.1	76.1	− 0.2	81.9	− 1.1	83.6	− 0.8	82.7	(1)	79.3	(1)	72.8	(1)	62.3	(1)	56.3	(1)
Jacksonville, Fla	55.5	− 4.8	57.9	− 4.4	62.4	− 2.5	68.8	− 2.3	75.3	+ 0.5	80.6	+ 0.1	82.5	− 1.6	80.9	− 0.5	77.9	+ 0.7	70.0	− 1.1	61.5	− 2.4	55.6	− 2.8
Keeler, Cal	42.8	± 0.0	50.8	± 0.0	50.9	− 3.4	56.7	− 1.1	68.2	+ 0.2	72.8	+ 3.0	80.0	− 0.1	81.2	+ 0.3	74.1	± 0.0	61.3	− 3.1	48.4	− 3.3	45.0	− 0.3
Keokuk, Iowa	23.5	− 8.9	29.4	− 3.1	37.6	− 1.1	51.3	− 2.3	63.3	+ 0.8	72.2	− 1.5	77.5	± 0.0	75.1	+ 2.0	66.3	+ 1.9	54.7	+ 2.9	38.7	− 0.2	28.2	− 7.0
Key West, Fla	69.9	− 6.1	71.3	− 5.3	73.3	− 2.3	76.7	− 2.2	79.9	− 1.0	83.2	+ 1.5	84.2	+ 1.5	84.3	+ 0.6	82.9	− 0.4	78.8	− 0.5	74.4	− 1.2	69.9	− 2.4
Kitty Hawk, N. C.[4]	42.0	− 4.6	43.3	− 5.2	47.5	− 0.9	54.1	+ 0.1	63.9	± 0.0	72.9	− 2.0	78.5	− 2.5	76.7	− 1.8	72.6	+ 0.2	63.9	± 0.0	52.9	+ 1.1	44.9	− 2.4
Knoxville, Tenn	37.1	− 4.5	41.5	− 4.4	47.5	+ 0.1	57.4	+ 1.7	66.4	+ 0.4	73.3	− 1.8	76.4	− 1.9	74.7	+ 0.1	68.7	+ 2.4	58.1	− 0.6	46.0	± 0.0	38.8	− 3.9
La Crosse, Wis	15.4	− 2.8	21.6	+ 0.2	31.2	− 0.2	47.0	+ 5.0	60.5	+ 2.1	68.7	+ 0.4	73.4	+ 1.7	70.9	+ 2.1	61.5	+ 0.3	50.3	+ 4.4	33.7	− 0.6	22.3	− 6.2
Lamar, Mo	19.3	± 0.0	33.4	± 0.0	41.7	+ 0.9	55.1	− 0.3	65.8	+ 3.9	71.4	− 0.7	77.0	+ 0.3	75.0	+ 1.5	68.1	+ 1.8	56.3	+ 2.9	45.0	− 2.3	32.1	− 4.2
Las Animas, Colo	19.5	− 1.6	29.2	+ 8.5	40.5	− 1.8	49.3	− 1.1	58.9	+ 6.7	69.3	+ 0.3	75.5	+ 1.7	72.7	+ 2.0	65.0	− 0.3	52.5	+ 2.7	37.0	− 4.7	28.7	+ 0.9
Leavenworth, Kans	24.8	−10.4	31.5	− 1.3	40.7	− 1.5	53.4	+ 1.0	64.9	+ 3.2	73.6	− 2.4	77.9	+ 0.5	76.2	+ 2.6	67.3	+ 3.2	55.8	+ 3.9	40.2	− 0.2	30.0	− 6.3
Little Rock, Ark	39.9	+10.8	46.1	− 5.3	52.9	− 4.2	62.6	− 1.7	70.1	+ 2.5	77.5	− 3.0	80.7	− 1.6	78.4	+ 0.8	72.6	+ 1.3	64.3	− 2.3	51.2	− 2.2	44.0	− 6.6
Los Angeles, Cal	52.8	+ 1.9	54.7	+ 4.8	55.9	− 1.6	58.2	− 1.0	62.0	+ 0.4	65.5	+ 0.6	68.6	+ 1.1	70.1	+ 1.7	67.5	− 1.9	62.4	− 3.1	58.1	− 1.5	55.1	+ 0.6
Louisville, Ky	34.2	− 3.2	38.2	− 5.5	44.2	− 0.3	55.7	+ 1.3	67.0	+ 0.6	74.5	− 3.1	78.8	− 1.9	76.2	− 0.9	69.0	+ 0.8	58.4	± 0.0	45.3	− 1.4	37.5	− 6.1
Lynchburgh, Va	36.4	− 5.1	39.9	− 4.2	45.4	+ 0.2	55.9	+ 1.2	66.3	− 0.7	74.2	− 3.7	78.5	− 3.8	75.5	− 1.7	68.8	+ 0.7	58.1	+ 1.9	45.8	+ 0.2	38.4	− 5.2
Mackinaw City, Mich	14.2	+ 0.8	13.3	+ 4.0	19.8	+ 6.7	36.5	+ 1.5	46.7	+ 3.2	58.7	− 0.5	63.6	+ 1.8	61.8	+ 1.8	57.2	± 0.0	48.0	+ 2.3	35.8	− 1.2	25.2	− 2.6
Macon, Fort, N. C.[4]	43.5	− 3.8	47.3	− 4.4	50.0	− 0.7	58.0	+ 2.6	68.0	+ 0.1	75.0	+ 0.2	79.0	− 0.1	77.7	− 1.2	77.9	− 3.1	66.4	− 1.6	55.3	− 0.1	47.6	− 2.4

[1] No record.
[2] Station closed May 7, 1886.
[3] Station closed December 8, 1886.
[4] Station closed December 31, 1886.
[5] Record incomplete.
[6] Station closed November 10, 1886.
[7] Station closed August 20, 1886.

Mean monthly temperature, and departure of 1886 therefrom (in degrees Fahrenheit), at stations of the Signal Service, etc.—Continued.

Stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.
Maginnis, Fort, Mont	15.5	— 6.1	20.2	+11.4	30.8	— 1.7	39.4	+ 1.7	49.6	+ 3.8	58.7	+ 1.1	63.6	+ 7.2	63.4	+ 2.4	51.9	— 0.9	41.8	+ 2.8	33.9	— 3.9	23.5	+ 0.1
Marquette, Mich	16.3	— 2.5	18.3	— 3.4	23.4	+ 0.7	37.1	+ 2.8	49.2	+ 0.2	58.6	— 2.4	65.0	— 0.9	64.4	— 1.6	56.5	— 1.4	45.9	+ 4.4	31.3	— 0.9	21.8	— 6.2
Memphis, Tenn	39.7	—10.1	44.4	— 4.5	51.6	— 2.7	61.2	— 0.5	70.7	+ 0.8	78.0	— 2.9	81.1	— 1.3	79.2	— 0.4	71.6	+ 1.8	61.8	+ 0.5	49.6	+ 0.2	42.0	— 4.7
Milwaukee, Wis	19.5	— 3.7	23.4	— 2.3	30.3	+ 0.4	42.0	+ 1.4	53.3	+ 1.0	62.8	— 1.3	68.8	± 0.0	68.3	— 0.4	60.9	— 0.2	49.7	+ 3.0	35.0	— 1.3	24.1	— 6.6
Mobile, Ala	50.0	— 5.9	54.3	— 4.6	59.5	— 2.8	66.8	— 2.9	74.1	— 1.9	80.4	— 2.5	81.7	— 3.1	80.6	— 0.7	76.8	+ 0.8	67.9	— 0.5	57.7	— 1.6	51.8	— 2.9
Montgomery, Ala	48.2	— 6.4	52.1	— 4.9	57.4	— 1.7	64.7	— 0.9	73.0	— 0.3	79.3	— 1.8	82.0	— 2.4	80.1	— 0.1	75.6	+ 1.7	65.8	+ 0.2	54.7	— 0.7	48.7	— 3.9
Montrose, Colo	23.4	± 0.0	31.2	+ 1.2	36.2	— 3.1	44.6	— 1.2	56.8	+ 3.0	64.4	+ 2.4	71.6	+ 2.3	68.0	+ 2.1	59.8	— 0.1	48.2	+ 0.3	33.0	— 4.3	29.8	+ 2.3
Moorhead, Minn	—3.1	— 3.8	5.5	+ 2.0	18.9	+ 5.0	39.6	+ 6.0	53.7	+ 2.7	64.1	— 0.9	67.2	+ 2.3	65.3	+ 1.5	55.3	— 1.1	43.2	+ 5.2	24.0	— 2.3	9.0	— 9.3
Mount Washington, N. H	5.4	+ 6.0	6.3	— 0.7	10.0	+ 1.3	21.3	+ 7.2	33.7	+ 0.8	43.7	— 1.5	47.6	— 0.6	47.0	— 0.2	40.4	— 0.2	30.3	+ 1.2	16.9	+ 2.4	9.2	— 0.7
Nashville, Tenn	37.9	— 8.9	42.4	— 7.0	49.1	— 2.0	59.5	— 1.1	69.3	— 1.2	76.6	— 4.3	79.8	— 2.8	78.0	— 2.4	70.6	+ 0.5	60.4	— 1.5	47.8	— 1.2	40.7	— 6.0
New Haven, Conn	27.3	— 1.9	28.9	— 2.8	34.7	— 0.3	45.8	+ 2.5	57.8	— 1.2	67.2	— 4.1	72.4	— 2.3	70.1	— 1.9	64.0	— 0.8	53.4	— 0.6	41.0	+ 1.7	31.0	— 3.7
New London, Conn	28.5	— 0.7	29.3	— 1.5	35.1	± 0.0	45.4	+ 2.7	56.3	+ 0.5	65.5	— 2.4	71.2	— 1.0	69.7	— 1.8	63.4	+ 1.2	53.6	— 0.2	41.4	+ 3.0	32.0	— 2.1
New Orleans, La	51.5	— 8.0	57.8	— 4.6	62.6	— 4.0	68.6	— 3.0	74.9	— 2.3	81.9	— 2.2	82.6	— 2.8	81.9	— 0.5	78.0	— 0.2	70.4	— 0.9	60.8	— 1.7	55.0	— 3.4
New York City	29.7	— 1.2	30.9	— 2.4	36.4	+ 0.5	47.3	+ 3.0	58.9	— 0.4	68.4	— 2.8	73.5	— 0.6	72.0	— 1.0	65.6	+ 1.5	55.6	+ 0.9	42.9	+ 2.4	33.2	— 2.4
Norfolk, Va	40.4	— 6.1	42.7	— 5.0	47.6	— 1.3	56.3	— 0.2	66.5	— 1.5	75.2	— 3.9	79.4	— 3.3	76.9	— 2.4	71.0	+ 0.6	61.2	+ 0.1	50.0	+ 1.2	42.2	— 4.6
North Platte, Nebr	19.5	— 3.5	26.4	+ 6.4	35.3	— 4.8	47.4	— 0.2	58.6	+ 4.4	68.0	— 0.4	73.7	+ 2.8	71.8	+ 2.0	61.7	— 0.1	49.9	+ 4.3	34.6	— 2.7	25.6	— 2.4
Olympia, Wash	38.1	— 1.5	39.8	+ 3.5	41.3	— 1.9	48.1	— 0.3	53.6	+ 0.6	58.9	+ 1.0	62.0	+ 1.4	62.1	+ 1.3	56.0	+ 0.9	49.0	— 0.5	43.8	— 1.7	40.6	+ 4.0
Omaha, Nebr	19.5	—12.2	26.2	— 1.8	35.4	— 3.5	49.9	+ 1.0	62.4	+ 2.7	71.5	— 1.3	76.2	+ 1.1	74.2	+ 1.4	63.8	+ 1.5	53.0	+ 5.3	36.0	— 1.8	24.5	— 6.6
Oswego, N. Y	25.1	— 6.0	25.4	— 4.2	31.1	— 1.1	42.6	+ 2.8	54.4	— 2.1	64.0	— 2.7	69.6	— 3.3	69.0	— 2.7	62.1	— 1.7	51.2	— 0.9	38.6	— 0.8	29.3	— 6.6
Palestine, Tex	41.3	— 2.0	51.6	— 1.4	58.4	— 3.4	65.2	— 1.6	71.0	+ 2.8	78.5	— 0.6	81.3	— 0.8	80.1	+ 1.1	75.7	+ 0.6	66.5	— 2.0	56.6	— 1.7	49.4	— 1.9
Pensacola, Fla	52.5	— 6.2	56.2	— 5.0	60.2	— 2.7	67.4	— 2.1	73.8	± 0.0	79.9	+ 0.5	81.0	— 0.8	80.4	+ 0.5	77.7	+ 1.4	70.4	— 1.4	59.0	— 0.6	54.2	— 2.9
Philadelphia, Pa	31.2	— 1.8	33.3	— 2.4	39.1	+ 0.9	50.0	+ 3.4	61.9	— 1.0	71.1	— 2.5	76.0	— 1.4	73.6	— 0.4	66.9	+ 2.3	56.3	+ 1.9	43.6	+ 2.9	34.3	— 3.3
Pike's Peak, Colo	2.5	— 0.5	3.7	+ 2.5	7.4	— 3.4	12.7	— 0.6	22.3	+ 4.8	32.5	+ 0.5	40.1	+ 2.4	38.6	+ 1.9	32.1	+ 0.5	21.4	+ 0.7	10.7	— 3.6	6.4	+ 2.2
Pittsburgh, Pa	30.1	— 2.7	32.5	— 2.2	38.1	+ 2.3	50.1	+ 5.2	62.1	+ 0.7	70.7	— 2.8	74.2	— 1.1	71.8	+ 0.3	65.0	+ 2.2	54.2	+ 0.9	40.9	+ 0.8	33.0	— 3.5
Poplar River, Mont	—3.4	— 4.6	4.1	+12.1	27.2	— 0.2	42.4	+ 2.8	55.2	+ 1.3	66.4	+ 0.7	69.3	+ 7.9	65.1	+ 3.9	54.0	— 0.9	42.7	+ 1.3	25.6	— 2.3	5.0	— 0.5
Port Angeles, Wash	33.2	± 0.0	41.5	+ 1.2	42.2	— 2.5	44.7	— 0.5	49.7	— 0.7	54.0	— 0.2	57.5	— 0.6	55.6	+ 0.2	52.5	— 0.4	46.1	— 1.1	41.2	— 1.7	40.5	+ 0.3
Port Huron, Mich	21.0	— 1.1	22.8	— 1.5	28.6	+ 1.8	41.0	+ 3.2	52.9	— 1.5	62.8	— 1.1	68.3	— 1.2	67.3	— 0.9	61.0	+ 0.4	49.8	+ 2.5	36.1	— 0.6	26.4	— 6.1
Portland, Me	23.1	— 1.8	25.6	— 4.1	32.1	— 2.9	43.6	+ 1.1	54.7	— 1.6	64.1	— 3.3	69.2	— 2.7	67.5	— 2.8	60.5	— 2.3	50.1	— 2.2	38.2	+ 0.5	28.9	— 5.8
Portland, Oregon	39.0	— 2.9	42.1	+ 2.6	47.3	— 2.5	51.6	— 1.7	56.5	+ 1.2	61.9	+ 1.0	66.4	+ 1.0	65.4	+ 1.4	60.7	+ 1.6	52.9	— 1.5	45.1	— 3.5	41.2	+ 4.3
Prescott, Ariz	32.8	+ 2.6	37.7	+ 4.3	42.8	— 4.1	49.0	— 2.3	57.1	+ 4.8	66.4	+ 1.0	72.8	+ 1.2	70.1	+ 1.1	63.3	+ 1.0	52.4	— 1.2	41.0	— 4.9	37.3	+ 3.2
Red Bluff, Cal	45.7	+ 0.5	49.6	+ 4.9	54.9	— 2.1	59.0	— 1.3	66.9	± 0.0	76.1	+ 3.0	82.2	+ 0.4	80.8	+ 0.7	74.1	+ 1.5	62.0	— 1.3	53.6	— 2.3	47.3	+ 2.7
Rio Grande City, Tex	56.1	— 3.8	62.4	— 0.6	69.8	— 1.3	76.6	— 1.1	80.5	— 0.2	85.2	— 1.2	86.4	— 2.2	83.7	+ 1.9	81.3	— 1.8	73.9	± 0.0	65.0	+ 2.3	59.9	+ 1.2
Rochester, N. Y	23.6	— 2.7	24.4	— 1.3	30.1	+ 1.4	43.0	+ 4.1	56.3	— 1.5	65.7	— 1.9	70.3	— 2.4	68.8	— 2.0	61.8	— 0.5	50.3	— 0.1	36.7	— 0.5	27.7	— 5.2
Roseburgh, Oregon	40.6	+ 0.6	42.8	+ 2.6	47.4	— 2.3	50.8	— 1.3	56.0	+ 0.7	61.2	+ 0.3	66.0	+ 1.4	65.3	+ 0.9	60.7	+ 0.7	51.2	— 0.5	44.3	— 3.4	42.2	+ 4.8
Sacramento, Cal	46.0	— 0.3	50.3	+ 3.0	54.7	— 2.6	57.7	— 2.2	63.4	— 1.4	68.7	+ 0.3	72.3	— 0.3	71.9	— 0.3	69.0	— 1.1	60.4	— 3.3	52.2	— 1.8	47.1	+ 2.1
Saint Louis, Mo	31.1	— 6.3	35.5	— 0.4	43.1	+ 1.4	55.4	+ 3.7	66.2	+ 3.2	74.5	— 0.3	78.9	+ 1.5	76.8	+ 3.1	68.5	+ 3.6	58.0	+ 3.8	43.3	+ 2.3	34.2	— 4.4
Saint Michaels, Fort, Alaska[1]	8.2	— 0.6	—2.3	— 0.6	8.9	— 2.4	19.9	+ 1.1	33.1	— 0.5	46.3	— 3.7	53.6	([2])	51.9	([2])	43.9	([2])	30.5	([2])	15.6	([2])	4.8	([2])
Saint Paul, Minn	12.4	+ 8.3	18.0	— 3.0	28.3	— 0.8	44.9	+ 4.3	58.5	+ 1.0	67.1	— 1.2	71.7	+ 1.0	69.4	+ 0.2	58.8	— 0.7	47.3	+ 5.6	31.0	— 3.1	18.2	— 9.8

Saint Vincent, Minn	-8.0	— 3.2	1.1	+ 3.8	13.9	+ 3.8	35.7	+ 7.8	51.7	+ 3.2	61.6	+ 0.9	64.4	+ 4.9	62.6	+ 1.6	52.2	— 1.8	40.5	+ 5.2	20.5	— 1.4	4.8	— 5.5
Salt Lake City, Utah	28.7	+ 0.4	33.8	+ 6.0	41.5	— 4.9	48.9	— 1.4	57.5	+ 4.1	67.5	+ 1.0	75.6	+ 2.7	74.6	+ 1.0	64.1	— 1.8	52.1	— 0.3	38.6	— 7.3	33.2	+ 3.4
San Antonio, Tex	50.7	— 6.5	55.7	— 0.4	63.1	— 3.9	69.6	— 3.7	75.4	— 0.9	91.5	— 2.7	82.8	— 1.0	82.2	+ 0.5	77.5	— 0.4	69.8	— 1.4	58.6	+ 0.1	53.8	— 1.0
San Diego, Cal	53.9	+ 2.0	54.8	+ 3.7	55.9	— 0.9	58.0	— 0.8	61.1	— 0.7	64.4	— 1.2	67.2	— 0.1	69.1	+ 1.4	66.8	— 0.2	62.6	— 2.9	58.2	— 2.2	55.6	+ 0.4
Sandusky, Ohio	26.5	— 3.8	29.5	— 3.0	35.4	— 0.5	47.1	+ 1.2	59.7	— 0.2	67.6	— 1.3	73.0	— 2.0	71.4	— 1.1	65.3	± 0.0	54.9	— 0.9	40.8	— 2.6	31.6	— 7.2
Sandy Hook, N. J.[3]	30.5	— 1.7	31.5	— 2.8	36.8	± 0.0	46.4	+ 2.3	58.4	— 0.5	68.2	— 3.3	74.0	— 1.3	72.6	— 0.8	67.1	+ 1.5	56.8	+ 0.6	44.9	+ 1.6	35.2	(2)
Sanford, Fla	57.0	— 3.9	60.4	— 3.0	64.2	— 2.0	69.6	— 3.5	74.8	— 0.4	78.8	+ 0.5	80.6	— 2.5	80.0	— 0.4	78.4	+ 0.9	73.2	— 0.6	65.2	— 1.3	60.4	— 2.5
San Francisco, Cal	50.6	+ 0.3	52.2	+ 3.6	53.6	— 1.0	54.6	+ 0.3	56.5	+ 1.3	58.4	— 0.5	58.5	+ 0.6	58.6	— 0.1	59.8	+ 0.7	59.0	— 1.9	55.8	— 0.7	51.9	+ 1.2
Santa Fé, N. Mex	27.6	— 2.4	32.2	+ 1.1	39.2	— 4.2	45.3	— 1.6	55.9	+ 3.8	65.0	— 1.4	68.2	+ 2.4	65.9	— 0.6	58.9	— 1.5	49.5	+ 0.1	36.7	— 3.0	30.7	+ 3.3
Savannah, Ga	51.3	— 5.4	54.1	— 3.5	59.2	— 2.0	66.4	— 1.7	73.7	+ 1.3	80.0	— 0.1	82.7	— 2.2	80.5	— 0.6	75.9	+ 1.3	66.8	— 0.6	57.8	+ 0.2	52.0	— 3.5
Shaw, Fort, Mont.[4]	15.7	— 8.2	22.9	+12.1	33.5	— 1.7	41.1	+ 4.1	51.1	+ 4.0	59.9	+ 1.3	64.4	+ 6.3	63.5	+ 3.1	53.0	— 0.2	42.5	+ 3.9	32.5	(2)	23.9	(2)
Shreveport, La	45.1	— 7.0	51.0	— 2.2	58.3	— 4.2	65.7	— 1.2	73.5	+ 2.4	80.5	— 1.8	83.0	— 1.4	82.0	± 0.0	75.0	+ 1.9	65.9	— 1.2	54.4	+ 0.2	49.0	— 2.7
Sill, Fort, Ind. T	34.8	— 7.6	41.7	— 0.9	51.7	— 3.0	61.7	— 2.0	69.8	+ 5.8	77.4	— 0.6	81.6	+ 3.3	79.8	+ 2.8	73.1	+ 2.9	62.2	+ 0.4	48.0	+ 0.2	38.0	— 0.6
Sitka, Alaska	35.2	— 6.0	34.5	+ 2.6	38.0	+ 0.2	42.3	— 1.4	47.2	— 0.3	51.9	+ 0.4	54.8	+ 2.4	56.5	+ 1.3	52.4	+ 1.4	45.7	+ 0.2	39.8	— 0.2	36.0	+ 2.0
Smithville, N. C.[6]	46.3	— 6.3	48.9	— 5.2	53.2	— 2.8	60.5	+ 0.4	69.6	+ 0.6	76.7	— 0.7	80.8	— 1.3	79.1	— 1.7	74.6	+ 0.7	65.5	— 2.0	54.8	(2)	48.1	(2)
Spokane Falls, Wash	23.1	— 0.7	28.5	+ 9.1	40.0	± 0.0	48.0	— 0.4	56.4	+ 2.2	63.9	+ 0.8	69.2	+ 3.3	68.0	+ 0.6	56.7	+ 1.1	45.6	+ 1.4	36.2	— 2.8	30.0	+ 5.1
Springfield, Ill	26.0	— 3.3	31.7	— 0.7	39.7	+ 1.6	53.2	+ 2.9	63.7	+ 1.9	71.4	± 0.0	76.6	+ 1.0	73.9	+ 2.2	66.4	+ 1.8	57.1	+ 0.8	42.4	± 0.0	31.6	— 5.2
Stanton, Fort, N. Mex	33.4	± 0.0	38.0	± 0.0	39.2	± 0.0	48.7	± 0.0	(5)	(5)	63.4	± 0.0	67.9	± 0.0	65.2	± 0.0	57.4	± 0.0	49.6	± 0.0	41.0	— 3.4	38.0	± 0.0
Stockton, Fort, Tex.[7]	43.0	(2)	48.8	+ 1.5	56.6	— 1.5	63.9	— 0.4	72.2	+ 4.5	78.8	— 1.4	80.6	(2)	78.0	(2)	71.9	(2)	63.4	(2)	50.6	(2)	45.5	(2)
Sully, Fort, Dak	10.0	— 8.2	18.5	+ 5.5	25.1	+ 3.6	43.2	+ 3.4	59.7	+ 1.9	68.6	— 0.9	75.3	+ 0.7	73.8	+ 1.9	61.5	— 0.4	48.5	+ 3.5	28.0	+ 2.0	18.5	— 9.2
Tatoosh Island, Wash	40.7	— 1.2	42.0	+ 2.4	44.5	— 1.1	47.7	— 1.2	50.9	— 0.2	54.0	+ 0.3	56.8	+ 0.8	56.2	+ 0.4	54.2	— 0.5	50.0	+ 0.2	46.6	— 1.1	42.7	+ 3.2
Thomas, Fort, Ariz	40.2	+ 1.0	46.8	+ 0.9	53.0	— 3.8	59.5	— 0.6	69.3	+ 4.4	78.6	+ 1.5	83.8	+ 3.2	80.6	+ 2.7	73.0	— 0.4	60.1	+ 1.3	48.2	— 1.8	43.3	+ 0.2
Toledo, Ohio	26.5	— 5.8	28.8	— 3.4	35.3	— 1.3	47.5	+ 1.5	59.0	+ 0.7	69.6	— 3.0	73.8	— 2.4	71.5	— 2.2	64.0	— 0.3	53.3	+ 0.1	39.4	— 2.8	30.2	— 7.9
Totten, Fort, Dak	-7.6	— 2.9	2.3	+ 4.3	17.6	— 0.1	40.6	+ 0.8	52.6	+ 1.7	61.0	+ 0.7	66.1	+ 4.1	63.8	+ 2.9	53.2	— 2.0	42.8	+ 8.2	23.5	— 3.7	5.1	— 5.3
Unabashka, Alaska[8]	33.5	+ 0.1	30.5	— 2.6	32.6	— 0.4	35.2	+ 0.9	40.4	+ 1.9	45.9	(2)	49.6	(2)	50.3	(2)	46.0	(2)	40.4	(2)	34.6	(2)	32.8	(2)
Valentine, Nebr	7.1	± 0.0	27.0	± 0.0	26.7	± 0.0	43.8	± 0.0	61.0	± 0.0	65.1	± 0.0	75.7	± 0.0	71.9	± 0.0	59.7	— 0.1	49.2	+ 2.8	33.6	— 3.7	24.0	— 4.8
Vicksburg, Miss	47.0	— 9.0	52.8	— 4.2	58.6	— 3.0	65.5	— 1.3	73.2	+ 0.1	79.7	— 3.3	81.8	— 1.8	80.4	± 0.0	75.1	+ 1.6	66.0	— 0.6	55.1	— 0.1	50.0	— 3.1
Walla Walla, Wash	25.8	± 0.0	43.2	± 0.0	44.5	± 0.0	52.0	± 0.0	61.4	± 0.0	68.0	± 0.0	76.7	± 0.0	73.9	± 0.0	64.0	± 0.0	50.2	± 0.0	39.8	± 0.0	40.4	— 0.7
Washington City	32.7	— 3.8	35.6	— 3.5	41.5	+ 0.5	52.8	+ 2.7	64.1	— 2.0	73.2	— 3.3	77.6	— 3.7	74.6	— 1.5	67.8	+ 1.5	57.7	— 0.1	44.2	+ 1.9	35.4	— 4.7
Wilmington, N. C	46.7	— 4.3	49.3	— 4.3	54.2	— 1.7	61.6	+ 0.5	69.7	+ 0.5	76.5	— 1.2	80.4	— 1.8	78.4	— 1.4	73.5	+ 1.4	64.1	— 0.1	54.3	+ 1.0	47.7	— 2.4
Winnemucca, Nev	29.7	+ 2.6	34.6	+ 5.7	41.0	— 4.6	47.0	— 3.0	53.8	+ 2.9	63.5	+ 0.7	71.7	— 0.2	71.0	+ 1.3	60.2	— 0.4	46.9	— 2.7	35.5	— 5.0	32.7	+ 4.4
Yankton, Dak	14.1	— 9.1	19.9	+ 3.0	29.9	— 1.8	45.4	+ 2.2	59.5	+ 2.8	68.5	— 0.7	73.5	+ 2.5	71.8	+ 1.2	61.3	+ 0.6	49.4	+ 5.9	32.2	— 1.5	20.4	— 6.4
Yuma, Ariz	53.7	+ 1.3	59.3	+ 3.4	64.4	— 3.9	69.0	— 1.6	77.4	+ 2.7	85.1	— 1.1	91.8	— 1.0	90.7	— 1.1	84.0	+ 0.2	71.9	— 4.5	60.8	— 3.0	56.2	+ 3.1

[1] Station closed June 30, 1886.
[2] No record.
[3] Station closed November 30, 1886.
[4] Station closed October 27, 1886.
[5] Record incomplete.
[6] Station closed October 31, 1886.
[7] Station closed June 20, 1886.
[8] Station closed May 22, 1886.

APPENDIX No. 18.

Mean daily range of temperature (in degrees Fahrenheit) at stations of the Signal Service U. S. Army, for each month of the year 1886.

[The daily range is the difference between the highest and lowest temperatures, as recorded by self-registering thermometers; the mean daily is obtained by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Abilene, Tex	25.1	26.9	22.8	24.3	26.3	22.9	23.3	20.5	17.3	19.8	21.4	23.8
Albany, N. Y	15.2	17.6	14.7	20.1	20.6	16.8	21.3	22.1	20.1	19.3	16.9	16.5
Alexander, Fort, Alaska[1]	15.2	13.5	14.2	13.5	10.1	(3)	......	......	......	......	......	......
Alpena, Mich	12.5	17.1	14.3	15.9	18.5	18.3	19.1	16.9	17.2	17.4	13.7	11.0
Apache, Fort, Ariz	24.7	35.2	34.2	30.6	43.1	45.7	34.2	28.7	30.8	31.8	32.4	35.4
Assinniboine, Fort, Mont	20.7	22.7	22.4	27.6	28.7	28.8	31.9	32.4	25.0	21.7	25.6	20.7
Atlanta, Ga	16.1	19.2	16.6	18.2	19.7	14.6	17.7	17.0	17.9	21.1	19.1	15.5
Atlantic City, N. J	15.8	15.6	14.6	13.8	12.6	13.1	12.6	12.5	12.5	14.5	16.5	14.5
Augusta, Ga	20.4	24.3	21.5	23.2	24.5	18.7	20.9	20.1	20.2	27.2	28.1	21.9
Baltimore, Md	13.1	17.1	14.9	17.4	16.7	15.5	15.8	15.3	16.9	18.2	17.1	13.7
Bering Island, Bering Sea[2]	7.0	5.5	7.5	7.3	(3)	......	......	......	......	......	......	......
Benton, Fort, Mont[4]	23.2	24.0	25.7	28.5	31.3	30.2	32.7	34.5	28.3	(7)	(7)	(7)
Bidwell, Fort, Cal	16.4	21.4	19.1	16.8	26.1	27.9	29.8	31.9	32.6	23.6	25.3	17.7
Bismarck, Dak	21.8	27.2	20.7	23.8	26.0	25.0	27.0	25.5	26.0	24.3	23.3	21.0
Block Island, R. I	10.8	13.6	12.1	11.5	11.1	10.9	11.5	10.9	10.0	10.8	12.4	12.1
Boisé City, Idaho	17.8	19.9	20.4	21.3	28.8	30.2	32.8	34.8	33.5	23.6	21.8	13.8
Boston, Mass	14.0	17.0	14.8	16.1	17.1	15.2	16.6	17.1	15.2	15.8	15.3	15.5
Bridger, Fort, Wyo	20.0	20.7	20.9	21.1	30.6	31.0	33.7	29.1	31.9	25.7	17.8	18.1
Brownsville, Tex	21.4	18.9	16.1	16.3	16.7	16.7	15.4	17.7	12.3	17.0	[5]17.3	20.9
Buffalo, N. Y	12.6	16.5	12.5	15.9	14.3	15.0	14.6	15.2	16.5	13.9	12.4	14.6
Buford, Fort, Dak	22.3	24.5	21.5	25.9	26.3	26.6	29.3	28.4	29.3	25.0	23.1	20.7
Cairo, Ill	15.0	15.8	14.5	14.5	16.6	13.4	17.0	16.2	16.3	20.7	16.7	13.5
Canby, Fort, Wash	7.5	6.8	8.8	9.7	10.1	8.9	8.3	7.3	10.3	9.4	9.3	7.8
Cape Henry, Va.[6]	12.8	16.4	15.1	13.3	15.6	10.7	11.2	8.8	9.3	11.5	15.7	13.3
Cape Mendocin, Cal.[6]	9.2	8.4	9.6	10.0	11.1	9.7	10.5	11.9	11.2	8.3	9.3	7.6
Cedar Keys, Fla	14.4	14.3	11.1	14.5	10.8	11.8	9.7	12.1	13.5	15.7	20.0	14.3
Charleston, S. C	15.8	16.6	15.3	15.2	15.6	12.1	13.1	11.9	12.7	15.5	18.4	13.8
Charlotte, N. C	17.1	21.0	20.0	21.9	21.5	18.0	20.6	19.9	20.3	25.9	22.8	15.8
Chattanooga, Tenn	15.5	21.0	17.5	19.9	20.8	15.3	19.5	18.0	19.7	24.8	20.8	17.9
Cheyenne, Wyo	23.8	23.4	22.5	22.7	34.3	29.1	31.2	26.3	29.4	26.4	(7)	(7)
Chicago, Ill	16.8	19.0	14.1	15.2	16.6	15.0	13.9	12.2	14.7	15.4	15.6	17.0
Chincoteague, Va	13.1	15.3	13.6	14.7	12.6	11.5	12.2	10.6	11.1	13.1	15.0	14.9
Cincinnati, Ohio	14.9	17.0	17.6	17.8	18.9	16.2	19.7	17.3	19.7	22.5	17.1	16.7
Cleveland, Ohio	14.1	17.8	15.6	16.9	16.5	17.1	17.7	16.2	18.0	19.0	14.8	16.0
Columbus, Ohio	15.0	17.3	17.5	18.2	20.9	20.1	22.5	20.4	22.3	22.9	17.2	17.8
Concordia, Kans	17.8	20.7	18.9	22.5	25.4	22.4	25.1	23.8	23.1	25.6	24.0	19.2
Custer, Fort, Mont	26.2	24.4	21.8	26.6	31.0	30.5	34.1	33.8	31.8	24.1	22.8	17.0
Davenport, Iowa	14.8	17.4	15.5	18.4	20.0	21.8	23.7	20.4	18.5	21.4	19.2	21.1
Davis, Fort	26.4	30.0	27.6	29.8	32.7	28.3	25.2	25.3	23.3	25.0	26.4	27.0
Deadwood, Dak	19.9	17.7	15.4	15.5	20.4	19.5	21.7	20.7	20.5	18.7	16.3	18.5
Denver, Colo	26.2	26.2	23.6	21.9	31.6	26.1	27.9	26.9	29.5	29.8	25.1	28.5
Des Moines, Iowa	14.8	17.3	15.7	18.8	22.7	24.7	26.8	23.1	19.4	20.8	17.6	17.1
Detroit, Mich	13.9	16.4	14.6	15.8	17.9	17.3	17.4	15.3	15.2	14.8	13.6	12.8
Dodge City, Kans	16.5	21.5	23.5	23.8	27.9	23.1	25.1	[8]23.4	23.3	23.4	30.0	27.2
Dubuque, Iowa	14.3	18.5	16.6	20.8	22.9	23.5	24.8	22.1	19.8	22.7	16.6	17.8
Duluth, Minn	16.9	20.7	20.1	14.5	22.4	20.1	18.5	15.8	15.8	18.8	15.8	18.3
Eastport, Me	15.5	16.3	12.3	15.0	13.7	17.8	17.5	14.9	13.6	(3)	(7)	(7)
Elliott, Fort, Tex	24.8	27.2	23.9	24.9	28.1	22.1	26.8	22.9	(3)	21.3	26.3	28.3
El Paso, Tex	24.2	29.0	29.2	32.0	33.6	33.4	31.7	27.9	[9]23.4	27.4	26.1	28.7
Erie, Pa	17.1	19.5	17.6	19.3	17.2	18.5	16.6	16.0	21.1	18.3	17.8	21.0
Escanaba, Mich	13.3	17.9	16.4	17.3	17.7	20.4	[8]18.8	15.6	15.1	16.2	14.8	15.5
Fort Smith, Ark	15.7	21.4	19.4	22.0	24.8	17.8	20.6	21.1	20.4	22.5	22.5	18.2
Frisco, Utah	15.6	16.8	16.5	18.6	19.7	21.1	19.9	18.9	18.8	17.2	17.6	15.1
Galveston, Tex	15.1	12.4	9.9	10.6	10.7	10.6	10.5	10.5	11.3	10.7	14.5	11.7

[1] Station closed June 12, 1886.
[2] Station closed May, 7, 1886.
[3] Incomplete.
[4] Station closed December 8, 1886.
[5] For 29 days.
[6] Station closed December 31, 1886.
[7] No record.
[8] For 25 days.
[9] For 20 days.

Mean daily range of temperature (in degrees Fahrenheit), etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Grand Haven, Mich	10.5	14.6	12.4	18.5	16.5	16.2	17.0	16.5	13.9	16.1	14.1	12.5
Grant, Fort, Ariz	18.5	21.1	22.3	24.8	22.8	([1])	([1])	22.4	19.8	21.0	22.1	21.9
Greencastle, Ind.[2]	16.3	16.9	16.4	15.8	18.6	15.8	18.6	16.5	16.4	17.6	([3])	......
Hatteras, N. C	11.6	16.1	12.3	12.8	11.9	10.9	8.7	8.7	9.8	11.2	14.3	15.6
Helena, Mont	19.8	17.0	18.0	22.2	23.5	25.1	28.8	28.7	23.7	18.4	18.2	17.4
Huron, Dak	22.5	24.1	18.2	24.3	27.9	26.8	27.2	26.5	27.6	28.3	22.6	21.7
Indianapolis, Ind	15.3	16.6	16.9	17.4	21.8	19.2	23.2	20.1	21.0	22.7	17.1	16.0
Indianola, Tex.[4]	16.1	14.9	12.1	11.4	14.2	13.3	12.6	......	......	......	......	......
Jacksonville, Fla	16.2	16.7	13.9	15.6	18.1	14.8	14.8	14.2	11.9	15.4	23.0	18.5
Keeler, Cal	16.8	21.9	20.3	21.9	24.3	26.0	25.2	22.7	25.3	21.8	20.6	18.6
Keokuk, Iowa	16.0	18.9	16.8	18.7	21.9	21.4	25.5	20.3	17.9	19.4	16.2	16.8
Key West, Fla	9.2	9.5	9.2	[5]9.8	9.5	14.2	15.0	12.2	12.1	7.5	7.9	9.3
Kitty Hawk, N. C.[6]	11.8	15.2	15.3	12.3	15.2	9.9	10.1	9.1	7.5	9.1	11.6	14.1
Knoxville, Tenn	16.5	20.5	17.8	19.6	20.6	16.5	19.6	19.2	20.7	25.8	20.7	16.3
La Crosse, Wis	15.3	18.4	15.6	17.5	18.4	18.3	19.4	17.8	16.1	18.6	14.7	16.1
Lamar, Mo	18.5	19.9	19.6	20.2	23.2	19.2	22.8	19.7	21.7	23.6	21.9	18.8
Las Animas, Colo	22.7	30.7	29.2	28.5	34.8	29.7	30.3	28.6	31.6	35.1	20.7	35.4
Leavenworth, Kans	17.2	20.1	18.0	19.7	23.9	21.2	24.6	23.2	22.4	23.8	34.4	17.7
Little Rock, Ark	12.5	19.9	17.9	19.1	20.6	15.9	17.5	17.8	18.1	21.1	19.8	16.7
Los Angeles, Cal	16.6	23.1	20.3	20.3	27.4	24.1	29.1	29.0	24.8	23.6	27.4	21.8
Louisville, Ky	15.4	18.1	17.4	18.1	20.9	17.7	21.2	19.1	21.1	23.1	19.8	16.8
Lynchburgh, Va	16.9	20.6	18.2	22.6	21.3	16.9	20.5	18.6	19.7	27.3	20.8	16.9
Mackinaw City, Mich	15.2	18.6	15.6	15.8	19.4	18.6	19.3	15.4	14.9	15.1	11.9	10.7
Macon, Fort, N. C.[6]	12.5	14.2	11.9	10.9	10.3	9.2	9.2	8.9	9.8	12.4	17.2	15.5
Maginnis, Fort, Mont	23.0	21.4	18.0	23.6	25.9	24.8	[7]27.9	27.3	24.7	20.5	20.1	19.4
Marquette, Mich	14.1	19.3	16.4	18.5	21.5	20.1	20.4	18.0	18.3	20.2	12.8	13.3
Memphis, Tenn	13.6	16.0	14.4	16.9	18.3	15.6	18.2	16.6	17.6	21.0	17.9	15.1
Milwaukee, Wis	14.0	15.2	10.9	16.0	20.2	18.2	19.0	13.0	16.6	18.5	15.6	16.5
Mobile, Ala	16.0	17.9	14.7	15.8	16.9	14.6	14.5	15.6	14.9	19.6	20.5	18.3
Montgomery, Ala	15.7	21.2	17.6	19.8	21.3	17.2	18.0	17.1	17.4	21.4	20.0	17.1
Montrose, Colo	20.4	24.7	25.4	24.2	30.5	31.9	32.1	29.0	29.7	27.3	26.4	23.8
Moorhead, Minn	20.0	24.4	18.6	23.5	25.4	25.9	24.8	26.7	25.9	26.3	22.5	19.2
Mt. Washington, N. H	17.2	19.6	14.0	13.0	11.7	13.6	10.8	12.7	13.7	13.3	14.9	18.4
Nashville, Tenn	15.9	20.5	17.2	19.0	20.6	16.8	21.1	18.8	21.1	24.8	21.1	17.0
New Haven, Conn	16.1	16.9	14.2	18.8	19.0	17.5	17.8	18.6	17.6	19.6	18.2	15.6
New London, Conn	13.9	15.5	13.8	15.3	16.7	14.2	14.3	14.9	14.2	17.3	17.2	14.8
New Orleans, La	14.3	17.5	13.8	16.3	16.4	14.2	13.6	14.3	12.6	14.5	17.6	16.3
New York City, N. Y	13.5	15.8	15.0	17.6	15.7	15.1	15.9	14.4	13.8	15.5	16.0	12.3
Norfolk, Va	13.5	19.4	17.9	18.0	19.1	14.6	15.6	13.5	13.0	16.3	18.5	14.5
North Platte, Nebr	19.7	21.6	21.5	21.6	25.0	21.2	24.7	23.8	24.2	23.3	20.4	18.5
Olympia, Wash	11.2	12.0	17.9	19.2	23.7	24.9	26.7	24.8	22.5	14.8	13.8	9.3
Omaha, Nebr	17.4	23.2	18.6	22.3	23.8	21.6	22.8	20.1	22.1	22.6	19.5	21.1
Oswego, N. Y	14.5	15.7	12.8	15.1	15.9	16.8	16.0	15.5	15.9	15.5	14.0	14.7
Palestine, Tex	20.2	21.6	19.0	18.5	20.8	18.3	19.0	20.4	18.0	19.5	20.8	20.0
Pensacola, Fla	14.3	16.2	13.2	13.8	13.8	12.6	12.3	13.3	12.2	16.7	18.4	16.7
Philadelphia, Pa	12.8	17.2	16.5	19.6	17.4	18.0	17.9	16.3	18.5	17.2	16.2	12.7
Pike's Peak, Colo	12.4	10.4	13.0	10.2	13.2	11.2	11.8	11.4	13.0	11.9	11.2	11.1
Pittsburgh, Pa	15.7	17.9	18.0	20.5	22.6	20.5	22.7	19.7	20.8	20.5	15.7	15.7
Poplar River, Mont	23.1	24.2	23.7	29.9	30.2	30.7	30.3	82.6	33.6	30.3	28.2	23.0
Port Angeles, Wash	16.0	13.5	15.5	14.2	17.3	15.8	16.5	17.3	16.7	14.8	14.9	9.8
Port Huron, Mich	11.6	14.5	13.0	17.3	18.7	17.5	17.8	16.7	19.9	18.1	14.7	14.3
Portland, Me	13.4	16.1	12.9	15.9	15.7	15.9	16.8	16.6	16.8	15.9	13.3	14.7
Portland, Oregon	11.6	14.3	16.8	17.3	21.4	22.0	24.8	24.5	22.4	15.8	14.2	10.6
Prescott, Ariz	20.0	29.4	24.6	27.1	34.2	36.4	30.6	22.4	29.9	29.4	31.0	28.4
Red Bluff, Cal	15.0	20.5	18.3	19.6	24.1	27.5	30.3	30.5	28.8	23.0	23.5	([1])
Rio Grande City, Tex	19.7	22.3	19.3	20.4	24.9	21.9	22.2	23.2	16.2	21.7	22.5	26.9
Rochester, N. Y	13.9	16.1	13.7	17.9	18.9	21.2	21.1	21.0	19.4	16.8	14.2	13.7
Roseburgh, Oregon	12.9	14.9	19.4	21.0	25.2	27.1	28.0	29.5	30.2	19.0	18.7	14.2
Sacramento, Cal	11.6	14.3	16.6	17.4	23.3	28.3	30.7	32.0	31.0	24.2	24.4	16.5
Saint Louis, Mo	18.8	18.5	16.7	15.6	17.7	15.3	16.9	18.1	16.3	17.9	16.8	17.1
Saint Michael's, Fort, Alaska[8]	13.0	13.2	18.4	18.7	10.9	12.6	......	......	......	......	......	......
Saint Paul, Minn	17.1	21.1	16.6	19.5	23.0	20.6	21.4	22.6	20.4	23.8	17.3	18.5
Saint Vincent, Minn	20.1	23.8	21.6	23.1	28.5	28.7	27.2	28.8	25.3	24.6	22.4	19.3
Salt Lake City, Utah	20.2	19.4	18.1	19.5	24.6	25.0	26.0	25.2	25.5	21.3	16.9	15.8
San Antonio, Tex	24.3	26.1	21.3	19.8	23.2	22.0	22.3	21.9	15.9	21.4	20.1	23.3
San Diego, Cal	13.0	18.0	14.1	11.3	12.9	10.9	11.0	12.0	9.6	13.3	17.8	14.2
Sandusky, Ohio	14.5	16.4	15.2	16.2	16.4	15.3	16.7	16.1	18.0	17.8	14.7	14.4
Sandy Hook, N. J.[9]	10.9	14.8	13.4	15.5	14.7	14.6	15.0	13.1	11.8	12.5	13.1	......
Sanford, Fla	17.1	19.2	16.2	16.0	19.7	17.9	15.7	15.7	13.3	11.3	19.2	18.1
San Francisco, Cal	10.7	13.9	14.1	12.4	14.6	16.7	14.8	16.2	17.2	15.0	14.7	10.5
Santa Fé, N. Mex	18.3	21.1	23.5	22.4	25.7	24.5	24.2	20.9	21.0	21.0	22.3	21.2

[1] No record.
[2] Station closed November 10, 1886.
[3] Incomplete.
[4] Station closed August 20, 1886.
[5] For 19 days.
[6] Station closed December 31, 1886.
[7] For 29 days.
[8] Station closed June 30, 1886.
[9] Station closed November 30, 1886.

Mean daily range of temperature (in degrees Fahrenheit), etc.—**Continued.**

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Savannah, Ga	16.6	17.7	14.0	15.8	15.7	13.0	13.5	12.5	12.9	15.8	20.7	17.2
Shaw, Fort, Mont.[1]	25.0	24.6	24.3	26.1	30.7	31.7	33.9	34.7	27.1	[2]23.7	......	......
Shreveport, La	19.1	21.9	18.1	20.5	24.2	20.1	19.8	22.3	19.4	20.5	21.2	21.7
Sill, Fort, Ind. T	22.6	27.5	25.1	25.0	28.7	22.0	23.5	23.8	19.6	22.2	22.7	23.6
Sitka, Alaska	13.4	9.9	10.3	13.7	15.9	14.7	13.8	11.3	9.6	10.2	10.6	11.2
Smithville, N. C.[3]	14.5	15.3	13.8	13.6	14.3	12.2	12.7	11.1	14.0	19.5	......	......
Spokane Falls, Wash	15.8	17.4	20.2	20.9	24.8	25.1	29.4	18.7	27.3	20.2	18.7	12.0
Springfield, Ill	20.1	19.8	17.8	17.4	20.8	19.4	21.8	29.4	18.5	20.6	18.4	18.1
Stanton, Fort, N. Mex	24.0	28.3	30.1	27.5	([4])	30.1	27.7	23.1	23.6	28.6	27.4	28.6
Stockton, Fort, Tex.[5]	([4])	33.9	33.9	32.6	34.4	28.8[6]	......	......	......	......	......	......
Sully, Fort, Dak	22.0	24.0	20.6	25.2	27.5	26.6	30.1	31.0	27.3	28.4	21.5	20.7
Tatoosh Island, Wash	8.3	7.3	8.2	7.9	9.8	10.4	9.8	9.3	9.3	7.4	7.1	7.1
Thomas, Fort, Ariz	25.6	34.6	33.3	36.5	43.2	40.6	30.8	27.3	27.4	31.2	31.9	36.1
Toledo, Ohio	14.6	16.2	15.9	18.0	20.6	19.5	21.9	18.2	19.0	19.5	14.4	14.4
Totten, Fort, Dak	20.2	25.3	22.8	21.8	24.8	23.4	25.9	27.3	25.8	22.6	21.3	17.6
Unalashka, Alaska[7]	6.6	8.2	10.1	9.4	[8]11.1	......	......	......	......	......	......	......
Valentine, Nebr	25.7	23.8	20.7	22.9	24.8	21.8	26.4	25.2	26.9	27.6	20.1	22.2
Vicksburg, Miss	16.5	20.8	18.5	20.3	18.7	16.1	17.9	18.5	18.1	21.7	20.3	18.3
Walla Walla, Wash	14.5	18.4	18.1	21.1	25.5	24.6	26.2	26.6	25.0	17.7	18.8	14.2
Washington City, D. C	14.1	18.5	16.4	19.2	16.9	16.3	16.3	17.1	18.3	21.9	19.3	15.9
Wilmington, N. C	18.1	23.4	20.0	19.1	18.5	15.8	16.2	15.0	18.1	23.2	24.2	19.5
Winnemucca, Nev	20.8	26.8	24.2	24.9	34.6	32.8	34.3	37.2	39.8	26.3	25.6	19.0
Yankton, Dak	19.4	22.6	15.8	21.6	24.3	23.0	24.7	22.4	22.1	27.4	20.3	19.5
Yuma, Ariz	19.1	26.0	[8]26.9	28.2	32.2	32.6	29.5	22.7	28.1	26.1	23.1	25.1

[1] Station closed October 27, 1886.
[2] For 27 days.
[3] Station closed October 31, 1886.
[4] Incomplete.
[5] Station closed June 20, 1886.
[6] For 20 days.
[7] Station closed May 22, 1886.
[8] For 22 days.

APPENDIX No. 19.

Mean maximum and mean minimum temperatures (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month of the year 1886.

[The monthly means are obtained by dividing the sum of the daily readings by the number of days in the month.]

Stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.
Abilene, Tex	49.2	24.1	63.1	36.2	66.2	43.4	74.8	50.5	91.2	64.9	91.3	68.4	97.7	74.3	93.5	73.0	84.1	66.7	75.7	55.9	63.3	41.8	57.5	33.7
Albany, N. Y	28.5	13.3	32.0	14.4	40.2	25.6	61.4	41.3	69.6	49.0	75.3	56.5	82.9	61.6	81.6	59.5	73.7	53.6	62.4	43.0	48.9	32.0	31.8	15.3
Alexander, Fort, Alaska[1]	19.7	4.5	17.8	4.3	26.5	12.3	35.0	21.5	42.2	32.1	(2)	(2)	......	......	......	......	......	......	......	......	......	......	......	......
Alpena, Mich	22.1	9.5	24.7	7.6	32.9	18.6	47.9	32.1	61.0	40.9	68.8	50.7	74.7	55.6	72.2	55.3	65.0	47.8	57.9	40.4	39.2	25.5	25.1	14.1
Apache, Fort, Ariz	48.4	23.7	61.5	26.3	59.8	25.7	68.9	32.3	85.8	42.6	92.9	47.1	94.4	60.2	88.9	60.2	80.9	50.6	70.5	38.7	56.8	24.5	60.2	24.8
Assinaboine, Fort, Mont	9.0	—11.7	41.1	18.5	39.1	16.8	60.5	30.3	71.7	43.0	80.7	52.4	90.2	58.3	83.8	51.5	66.6	41.6	57.0	35.2	40.9	15.3	27.6	6.9
Atlanta, Ga	44.2	28.2	51.6	32.4	59.2	42.6	70.0	51.8	78.4	58.7	80.8	66.3	85.6	67.8	85.7	68.8	82.8	64.9	73.2	52.1	60.2	41.1	48.2	32.6
Atlantic City, N. J	37.7	21.9	37.9	22.3	45.5	30.8	54.8	41.0	62.2	49.5	71.9	58.8	78.4	65.9	77.6	65.1	75.4	62.8	65.5	51.0	55.0	38.5	40.6	26.1
Augusta, Ga	51.0	30.5	57.9	33.6	65.4	43.9	75.5	52.3	85.3	60.8	86.6	67.9	90.4	69.5	89.5	69.4	87.0	66.8	77.3	50.1	67.8	39.7	55.2	33.3
Baltimore, Md	36.0	22.9	41.6	24.5	49.6	34.8	64.4	46.9	70.9	54.1	78.1	62.6	82.8	67.1	82.0	66.6	78.5	61.7	68.5	50.3	55.6	38.4	38.4	24.7
Behring's Island, Behring Sea[3]	30.7	23.8	30.2	24.6	31.3	23.8	35.1	27.9	(2)	(2)	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Benton, Fort, Mont[4]	16.7	— 6.4	47.5	23.5	44.5	18.7	62.1	33.6	75.0	43.7	82.3	52.1	93.1	60.4	88.1	53.7	69.9	41.6	......	......	......	......	......	......
Bidwell, Fort, Cal	38.1	21.7	52.3	30.9	45.6	26.5	52.9	36.0	66.5	40.5	75.0	47.1	82.9	53.1	84.9	53.0	75.5	42.9	56.5	32.8	45.9	20.6	46.5	28.8
Bismarck, Dak	7.5	—14.3	31.6	4.4	35.6	14.9	57.5	33.7	72.5	46.5	78.2	53.2	89.5	62.5	83.3	57.7	69.0	43.0	60.4	36.1	38.2	14.9	16.0	— 5.0
Block Island, R. I	35.4	24.6	35.8	22.1	40.6	28.4	52.1	40.6	59.8	48.6	67.2	56.3	74.4	62.9	72.9	62.0	71.0	59.9	60.1	49.3	52.7	40.2	40.8	28.7
Boisé City, Idaho	36.8	19.0	51.3	31.3	50.0	29.7	58.7	37.4	73.5	44.7	81.7	51.6	91.1	58.3	90.1	55.3	75.8	42.3	60.9	37.3	44.0	22.5	44.0	30.2
Boston, Mass	32.7	18.7	35.2	18.2	40.5	26.2	56.7	40.6	65.3	48.3	70.8	55.7	79.6	63.0	76.8	59.7	70.7	55.5	59.6	44.3	50.9	35.5	36.1	20.6
Bridger, Fort, Wyo	30.8	10.8	39.9	19.2	35.1	14.2	48.2	27.8	65.9	35.3	70.9	39.9	81.1	47.4	78.5	49.4	68.0	36.1	53.3	27.6	32.8	15.0	38.6	20.6
Brownsville, Tex	65.0	43.6	72.2	53.3	74.8	58.7	80.7	64.4	85.1	68.4	89.7	73.0	89.1	73.7	91.5	73.8	85.3	72.9	82.7	65.7	[5]75.1	[5]57.8	72.3	51.4
Buffalo, N. Y	29.1	16.5	32.6	16.0	38.3	25.8	55.2	39.4	60.8	46.4	70.8	55.7	75.2	60.6	74.8	59.6	71.4	55.0	59.3	45.4	44.4	32.1	31.9	17.3
Buford, Fort, Dak	7.2	—15.1	30.5	6.0	37.3	15.9	58.3	32.5	70.9	44.6	79.5	52.9	91.1	61.8	84.5	56.1	69.0	39.7	58.2	33.2	37.7	14.6	16.9	— 3.8
Cairo, Ill	32.4	17.4	42.7	26.9	52.0	37.5	65.4	50.9	77.4	60.8	79.4	65.9	87.0	70.0	85.8	69.6	79.7	63.4	70.5	49.8	53.8	37.1	38.0	24.5
Canby, Fort, Wash	44.3	36.7	50.2	43.4	49.0	40.3	53.5	43.8	57.3	47.2	60.8	51.9	63.5	55.2	63.7	56.4	64.1	53.9	57.4	48.1	50.2	40.9	51.3	43.6
Cape Henry, Va[6]	41.6	28.7	45.0	29.0	52.8	37.7	60.3	47.0	71.4	55.7	75.4	64.7	80.9	69.6	79.0	70.2	77.0	67.7	68.4	56.9	60.4	44.7	45.7	32.4
Cape Mendocino, Cal[6]	52.7	43.5	54.5	46.1	51.1	41.5	52.9	42.9	59.5	46.4	59.6	49.9	61.9	51.4	63.8	51.9	64.0	52.8	58.1	49.8	56.7	47.4	55.4	47.8
Cedar Keys, Fla	57.2	42.9	61.7	47.4	65.5	54.4	73.8	59.4	79.6	68.8	86.2	74.4	84.5	74.9	87.0	75.1	86.6	73.1	79.5	63.8	71.9	51.9	62.1	47.8
Charleston, S. C	50.7	35.0	56.3	39.7	61.7	46.4	70.7	55.5	81.0	65.3	83.6	71.5	86.8	73.7	85.3	73.3	83.3	70.5	75.1	59.6	66.9	48.5	55.7	41.9

[1] Station closed June 12, 1886.
[2] Incomplete.
[3] Station closed May 7, 1886.
[4] Station closed December 8, 1886.
[5] For 29 days.
[6] Station closed December 31, 1886.

Mean maximum and mean minimum temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army—Continued.

Stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.
Charlotte, N. C	44.1	27.0	50.6	29.6	58.8	38.8	70.6	48.7	78.9	57.4	81.5	63.5	86.7	66.1	85.5	65.5	82.5	62.2	73.1	47.2	62.0	39.1	47.3	31.5
Chattanooga, Tenn	41.4	25.8	49.9	28.9	58.8	41.3	70.5	50.6	78.5	57.7	80.7	65.4	86.2	66.7	86.1	68.1	82.3	62.5	73.4	48.6	58.7	37.9	47.1	29.2
Cheyenne, Wyo	32.1	8.8	45.3	22.0	41.7	19.2	51.2	28.5	72.9	38.6	75.3	46.2	85.2	54.0	80.3	50.4	70.5	41.1	61.6	35.2	([1])	([1])	([1])	([1])
Chicago, Ill	30.8	14.0	38.9	19.9	44.2	30.1	57.3	42.1	65.5	48.9	73.7	58.7	78.8	64.9	78.7	66.5	73.0	58.7	64.7	49.3	46.2	30.5	33.8	16.8
Chincoteague, Va	39.8	26.7	42.0	26.7	48.5	34.9	59.5	44.8	65.8	53.2	74.6	63.1	80.1	68.1	78.2	67.6	76.3	65.1	67.6	54.6	57.2	42.2	44.8	29.9
Cincinnati, Ohio	33.4	18.4	38.6	21.6	51.7	34.1	64.7	46.9	75.1	56.2	78.5	62.3	85.1	65.4	83.2	65.9	79.0	59.3	68.1	46.7	50.2	33.2	36.1	19.4
Cleveland, Ohio	30.6	16.5	34.1	16.3	43.4	27.7	58.2	41.3	66.2	49.7	73.6	56.5	78.2	60.6	77.0	61.5	74.2	56.2	63.7	44.7	45.8	31.5	32.4	16.4
Columbus, Ohio	31.0	15.9	35.5	18.2	47.7	30.2	63.8	45.6	73.2	52.3	77.4	57.2	83.5	61.0	81.8	61.4	77.1	54.6	65.8	42.9	47.3	30.2	36.1	18.3
Concordia, Kans	20.0	2.2	41.9	21.2	45.1	26.2	63.0	40.5	79.7	54.3	82.6	60.2	90.6	65.4	88.9	65.2	81.0	57.9	72.8	47.2	49.7	25.7	34.7	15.2
Custer, Fort, Mont	14.4	—11.8	44.6	20.3	43.5	21.7	60.4	33.7	75.0	44.1	82.1	51.5	94.2	60.0	89.9	56.2	72.7	40.9	59.1	34.9	43.0	20.1	32.9	16.0
Davenport, Iowa	21.0	6.3	32.7	15.3	41.1	25.6	61.8	43.8	73.0	53.0	81.1	59.3	88.7	65.0	85.6	65.1	75.5	57.0	67.3	46.0	46.6	27.4	29.9	8.8
Davis, Fort, Tex	56.4	30.0	63.1	33.2	66.9	39.4	75.5	45.6	89.5	56.8	88.9	60.6	91.3	66.1	90.4	65.1	82.2	58.0	77.1	52.0	63.6	37.2	64.3	37.4
Deadwood, Dak	24.8	5.0	40.1	22.4	37.1	21.6	49.9	34.3	65.4	44.9	69.7	50.2	82.9	61.2	78.1	57.4	65.3	44.8	58.2	39.5	37.8	21.4	34.0	5.5
Denver, Colo	35.0	8.8	52.2	26.0	46.3	22.6	56.5	34.6	77.7	46.1	78.8	52.7	88.2	60.3	85.2	58.3	75.1	45.6	66.8	37.0	45.5	20.4	49.6	21.1
Des Moines, Iowa	18.3	3.5	33.4	16.1	43.5	27.8	63.3	44.5	77.3	54.0	85.2	60.6	93.6	66.8	90.1	67.0	76.4	57.0	68.4	47.6	45.4	27.7	27.0	10.0
Detroit, Mich	31.1	17.2	35.8	19.4	43.3	28.7	58.9	43.1	67.9	50.0	75.9	58.6	80.2	62.8	78.3	63.0	72.8	57.6	62.8	48.0	45.5	31.9	30.2	17.5
Dodge City, Kans	25.1	8.7	46.5	25.0	52.3	28.8	63.7	39.9	82.9	55.0	83.6	60.4	92.0	66.8	[2]94.1	[2]68.0	80.2	56.9	71.5	48.2	54.2	24.2	43.5	16.3
Dubuque, Iowa	19.6	5.3	31.3	12.8	39.9	23.3	62.3	41.4	73.1	50.2	80.4	56.9	88.0	63.2	85.9	63.8	74.2	54.4	66.8	44.1	42.1	25.4	24.6	6.8
Duluth, Minn	14.5	— 2.4	23.9	3.2	34.9	14.8	45.5	31.1	65.0	42.6	69.0	49.0	76.2	57.7	72.6	56.8	60.2	44.4	58.2	39.3	37.0	21.2	18.2	— 0.1
Eastport, Me	30.5	15.0	29.6	13.2	34.0	21.7	48.2	33.2	54.0	40.3	64.8	47.0	69.4	51.9	67.2	52.3	61.7	48.1	([3])	([3])	([1])	([1])	([1])	([1])
Elliott, Fort, Tex	39.1	14.3	54.0	26.8	57.6	33.7	67.2	42.4	84.2	56.1	84.0	61.9	92.7	65.9	89.5	66.6	([3])	([3])	70.8	49.5	57.6	31.3	49.6	21.3
El Paso, Tex	55.4	31.2	63.8	34.8	62.8	39.0	79.8	47.8	95.7	62.1	99.3	65.9	102.0	70.3	97.5	69.6	[4]85.4	[4]62.1	77.4	50.0	61.8	35.7	62.7	34.0
Erie, Pa	33.8	16.6	35.1	15.6	41.9	24.3	57.1	37.8	64.2	47.0	72.6	54.1	76.4	59.8	77.0	61.0	75.9	54.8	63.5	45.2	49.2	31.4	38.6	17.8
Escanaba, Mich	19.3	6.1	23.7	5.8	32.2	15.8	47.1	29.8	59.0	41.3	71.3	50.8	74.8	56.0	70.4	54.7	62.4	47.2	55.5	39.3	37.2	22.3	22.4	6.9
Fort Smith, Ark	35.5	19.8	49.8	28.4	58.4	39.0	71.5	49.5	85.6	60.8	84.2	66.4	91.5	71.0	91.5	70.4	85.9	65.4	74.2	51.6	59.5	37.0	46.3	28.0
Frisco, Utah	37.2	21.6	48.2	31.4	40.5	24.0	51.5	32.9	69.5	49.8	77.4	56.4	84.7	64.8	80.6	61.8	72.8	54.0	56.2	39.0	40.8	23.2	46.2	31.1
Galveston, Tex	54.9	39.8	59.4	47.1	63.6	53.6	72.1	61.5	80.6	69.9	85.8	75.2	88.5	78.0	88.9	78.6	85.2	73.9	77.2	66.4	69.6	55.1	62.3	50.6
Grand Haven, Mich	25.4	14.9	30.4	15.3	37.0	24.7	57.8	39.3	61.7	45.2	69.8	53.6	75.4	58.4	76.2	59.8	68.8	54.9	60.2	44.0	42.9	28.8	28.0	15.6
Grant, Fort, Ariz	51.6	33.2	61.5	40.4	60.2	37.9	68.7	44.0	79.4	56.6	([1])	([1])	([1])	([1])	88.6	66.2	80.5	60.6	72.9	51.9	60.0	38.0	63.3	41.3
Green Bay, Wis	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	67.9	50.5	61.3	42.1	37.6	23.5	21.1	5.8
Greencastle, Ind.[5]	30.3	14.0	38.2	21.3	48.5	32.1	63.3	47.5	73.4	54.9	76.9	61.1	83.4	64.8	82.5	66.0	75.3	58.9	65.9	48.3	([3])	([3])	....	.....
Hatteras, N. C	46.3	34.7	50.5	34.5	55.3	43.0	65.9	53.1	72.1	60.3	78.8	68.0	82.1	73.5	80.1	71.5	79.4	69.6	70.7	59.5	62.8	49.6	54.1	38.5
Helena, Mont	21.2	1.4	44.4	27.4	38.6	20.6	55.4	33.2	67.5	44.0	74.4	49.2	85.3	56.3	83.9	55.2	65.7	42.0	53.0	34.6	38.5	20.2	36.1	18.7
Huron, Dak	11.4	—11.1	31.4	7.3	36.5	18.4	59.3	35.0	74.2	46.4	78.9	52.1	89.7	62.5	84.4	57.9	73.8	46.2	66.2	37.9	38.9	16.3	19.8	— 1.9
Indianapolis, Ind	30.0	14.6	36.5	19.9	47.9	31.0	63.6	46.1	75.3	53.5	78.8	59.6	86.1	62.9	84.1	64.0	77.9	56.9	67.4	44.7	48.1	31.1	33.0	17.0
Indianola, Tex.[6]	54.4	38.3	63.2	48.4	67.3	55.2	74.2	62.8	84.2	70.0	89.0	75.7	90.3	77.7	....	.....	....	.....	....	.....	....	.....	....	.....
Jacksonville, Fla	59.4	43.2	62.5	45.8	67.2	53.3	74.8	59.2	85.0	66.9	88.6	73.9	89.3	74.5	88.8	74.5	84.5	73.5	77.9	62.5	71.6	48.6	62.9	44.4

Keeler, Cal	51.4	34.5	62.6	40.7	58.3	38.0	67.3	45.5	80.7	56.4	89.5	63.5	93.4	68.1	94.0	71.3	87.3	62.0	68.6	46.8	56.3	35.7	54.7	36.1
Keokuk, Iowa	22.9	7.0	36.6	17.7	45.8	29.0	63.8	45.1	75.7	53.8	81.9	60.5	90.5	60.5	88.1	67.8	77.8	55.9	68.1	48.7	47.6	31.4	30.1	13.3
Key West, Fla	68.9	59.6	71.5	62.1	76.0	66.7	[7]79.8	[7]70.0	84.8	75.2	92.5	68.3	94.0	79.0	91.4	79.2	89.2	77.1	82.3	74.9	78.0	70.0	72.8	63.5
Kitty Hawk, N. C.[8]	43.5	31.8	46.4	31.2	54.9	39.6	60.9	48.6	72.4	57.2	76.4	66.4	81.5	71.4	79.8	70.7	77.5	70.0	68.7	59.6	57.9	46.3	50.1	36.1
Knoxville, Tenn	41.5	25.0	47.3	26.8	57.2	39.4	69.1	49.5	77.0	66.5	80.3	63.8	84.6	65.0	84.9	65.7	81.7	60.9	71.5	45.8	56.8	36.1	42.9	26.6
La Crosse, Wis	20.3	5.0	31.6	13.2	39.1	23.4	61.4	43.9	71.5	53.0	78.4	60.1	85.1	65.7	82.3	64.6	70.7	54.5	64.5	46.0	41.4	26.6	25.1	9.0
Lamar, Mo	28.7	10.2	43.0	23.2	53.2	33.5	66.1	45.9	81.7	58.6	81.2	62.9	89.8	66.9	87.6	67.9	81.9	60.3	72.0	48.4	54.0	32.1	33.2	19.4
Las Animas, Colo	29.6	6.9	55.2	24.5	54.9	25.2	64.4	35.9	83.8	49.5	85.9	56.2	93.9	63.6	91.1	62.5	82.4	50.8	74.0	38.9	51.6	30.9	49.6	14.2
Leavenworth, Kans	23.0	5.8	41.0	21.0	48.9	30.9	65.2	45.5	81.0	57.1	83.1	61.9	91.8	67.2	92.0	68.8	83.4	61.0	72.7	48.9	51.7	17.2	33.0	15.4
Little Rock, Ark	36.1	23.6	51.1	31.2	58.5	40.6	70.7	51.7	83.8	63.2	83.5	67.6	89.0	71.4	89.4	71.6	84.0	66.0	73.7	52.5	59.2	39.4	46.6	29.9
Los Angeles, Cal	63.6	47.0	71.6	48.5	65.6	45.3	69.0	48.7	78.5	51.1	80.9	56.8	86.9	57.9	89.1	60.1	79.9	55.1	71.9	48.3	70.4	43.0	67.3	45.5
Louisville, Ky	38.8	23.4	41.4	23.3	52.7	35.3	66.8	48.7	78.5	57.6	81.2	63.5	88.3	67.1	86.4	67.3	81.2	60.1	70.6	47.5	53.7	34.0	39.7	23.0
Lynchburgh, Va	40.2	23.3	46.9	26.4	55.0	36.7	68.7	46.0	76.4	55.1	79.6	62.7	85.9	65.4	84.2	65.7	80.3	60.5	71.3	44.0	57.6	36.8	42.6	25.7
Mackinaw City, Mich	21.9	6.6	25.9	7.3	33.2	17.6	46.5	30.8	60.1	40.7	67.8	49.2	75.6	56.2	71.6	56.3	65.5	50.6	57.7	42.7	40.7	28.8	27.4	16.7
Macon, Fort, N. C.[8]	46.5	34.0	50.3	36.1	55.1	43.2	66.7	55.8	73.0	62.8	79.6	70.4	83.3	74.0	81.4	72.5	80.0	70.2	71.7	59.3	62.2	45.0	52.8	37.3
Maginnis, Fort, Mont	20.9	—2.1	44.1	22.7	38.7	20.7	54.7	31.1	67.8	41.8	74.1	49.3	[9]86.6	[9]58.7	81.1	53.8	64.8	40.1	56.9	36.5	41.9	21.8	34.1	15.7
Marquette, Mich	22.3	8.2	26.1	6.8	33.6	17.2	49.9	31.4	60.9	39.5	67.2	47.1	74.9	54.5	72.3	54.3	65.3	47.1	60.8	40.6	37.8	25.0	22.5	9.4
Memphis, Tenn	36.9	23.3	48.2	32.2	56.8	42.4	70.1	53.2	81.2	62.9	84.2	68.6	89.5	71.3	88.2	71.6	83.6	66.0	73.8	52.8	58.8	41.0	45.4	30.4
Milwaukee, Wis	22.3	8.3	28.9	13.7	36.5	25.6	52.5	36.5	65.6	45.4	71.6	53.4	79.4	60.4	75.6	62.6	69.6	53.0	63.0	44.5	41.3	25.7	25.5	9.0
Mobile, Ala	51.7	35.5	58.4	40.5	64.5	49.8	72.0	56.2	80.6	63.7	86.3	71.8	87.2	72.8	89.0	73.3	86.3	71.4	77.7	58.1	66.3	45.8	58.1	39.8
Montgomery, Ala	49.5	33.8	57.9	36.6	61.8	47.2	74.7	54.9	84.5	63.1	87.8	70.5	90.1	72.1	89.9	72.8	87.2	69.8	77.6	56.3	64.4	44.4	53.8	36.7
Montrose, Colo	34.8	14.4	47.0	22.4	48.0	22.3	57.2	33.0	76.2	45.7	83.7	51.8	91.1	59.0	86.1	57.1	75.7	46.0	63.6	36.3	42.1	15.6	44.4	20.6
Moorhead, Minn	3.0	—17.0	20.0	—4.4	33.3	14.6	57.8	34.3	68.7	43.2	75.3	49.4	82.4	57.6	81.1	54.3	67.5	41.6	62.2	35.9	33.4	10.9	9.1	—10.1
Mount Washington, N. H.	20.3	3.1	15.7	—3.9	17.4	3.4	35.4	22.5	40.7	29.0	49.3	35.8	52.6	41.9	53.7	41.0	47.6	33.9	37.9	24.6	26.9	11.9	17.3	—1.2
Nashville, Tenn	37.4	21.4	45.5	25.0	56.1	38.8	68.3	49.3	79.2	58.5	81.5	64.8	88.2	67.1	86.5	67.7	82.2	61.1	72.1	47.3	56.9	35.8	43.2	26.2
New Haven, Conn	33.2	17.1	35.2	18.2	42.0	27.2	58.5	39.7	66.2	47.2	72.0	54.4	79.3	61.6	78.1	59.5	72.6	55.0	63.2	43.6	52.1	33.8	35.6	20.0
New London, Conn	34.2	20.3	35.6	20.1	41.9	28.2	56.7	41.3	65.1	48.5	70.0	55.8	77.3	63.0	75.6	60.7	71.4	57.3	62.4	45.1	52.9	35.8	37.3	22.4
New Orleans, La	53.0	38.7	62.4	44.9	66.1	52.3	74.6	58.3	82.1	65.7	87.3	73.2	88.1	74.5	89.9	75.6	85.3	72.7	77.9	63.4	68.5	50.9	60.1	43.8
New York City	35.7	22.2	37.1	21.3	45.2	30.2	60.2	42.6	67.0	51.3	73.8	58.7	81.5	65.6	79.3	64.9	74.9	61.1	65.4	49.9	54.8	38.8	37.8	25.5
Norfolk, Va	42.1	28.6	48.5	29.1	56.2	38.3	66.3	48.3	73.2	54.1	79.4	64.8	84.8	69.2	82.7	69.2	79.1	66.1	70.6	54.3	61.1	42.6	46.2	31.8
North Platte, Nebr	21.6	6.4	45.4	23.8	42.3	20.8	59.5	37.9	77.1	52.1	79.0	57.7	89.4	64.6	86.8	63.0	74.6	50.4	66.7	44.3	42.6	22.2	33.7	15.1
Olympia, Wash	41.9	30.7	49.5	37.5	51.8	33.9	58.1	38.9	66.3	42.7	72.6	47.7	76.7	50.0	76.5	51.7	69.2	46.7	56.5	41.7	49.3	35.5	49.2	39.9
Omaha, Nebr	17.0	—0.4	38.0	14.8	43.2	24.7	64.1	41.8	77.9	54.1	82.1	60.5	89.5	66.7	86.9	66.9	77.9	55.8	70.0	47.4	45.5	25.9	29.7	8.6
Oswego, N. Y	26.4	11.9	29.2	13.4	36.8	23.9	53.1	38.0	60.3	44.4	69.6	52.8	73.7	57.8	74.4	58.9	68.6	52.7	58.1	42.6	44.8	30.8	29.3	14.7
Palestine, Tex	50.0	29.8	61.8	40.2	65.8	46.8	73.9	55.4	85.3	64.5	88.7	70.4	91.8	72.7	93.3	72.9	86.8	68.8	75.2	55.7	66.3	45.4	58.4	38.4
Pensacola, Fla	53.3	39.0	59.9	43.6	64.8	51.6	72.5	58.8	81.4	67.5	87.5	74.9	87.2	74.9	88.8	75.5	85.8	73.6	78.3	61.6	67.7	49.4	60.4	43.7
Philadelphia, Pa	36.3	23.6	40.5	23.3	48.4	31.9	61.3	44.8	70.2	52.8	78.5	60.5	84.7	66.8	82.5	66.2	79.3	60.8	67.8	50.6	54.9	38.6	37.7	25.0
Pike's Peak, Colo	8.4	—4.0	11.7	1.2	10.9	—2.1	17.8	7.6	34.8	21.5	39.7	28.4	49.8	37.9	47.3	35.9	40.5	27.5	28.9	17.0	13.5	2.3	14.4	3.3
Pittsburgh, Pa	35.4	19.7	39.5	21.6	50.4	32.4	66.8	46.3	24.9	52.4	79.2	58.2	85.9	63.2	83.6	63.9	79.1	58.3	66.6	46.1	50.2	34.5	37.8	22.1
Poplar River, Mont	4.1	—19.0	29.4	5.2	38.6	14.8	60.6	30.6	72.8	42.6	82.3	51.5	91.7	61.4	86.3	53.7	69.9	36.3	60.0	29.7	38.4	10.1	16.7	—6.3
Port Angeles, Wash	39.4	23.3	46.9	33.4	48.3	32.8	51.8	37.6	57.8	40.5	62.3	42.5	65.9	49.4	65.3	48.0	61.4	44.7	52.6	37.8	47.5	32.6	45.4	35.6
Port Huron, Mich	25.2	13.6	28.1	13.7	37.4	24.4	53.6	36.4	61.5	42.8	70.5	53.0	76.0	58.3	75.5	58.9	72.2	52.3	61.6	43.5	43.4	28.7	26.8	12.4
Portland, Me	28.2	14.8	30.0	13.9	35.8	22.9	53.0	37.1	61.1	45.4	68.6	52.7	75.1	58.3	73.7	57.1	67.2	50.3	56.2	40.2	45.4	32.1	30.1	15.3
Portland, Oregon	43.3	31.7	53.4	39.1	54.3	37.5	59.9	42.6	69.9	48.5	75.5	53.5	81.2	56.4	79.8	55.3	74.6	52.2	60.2	44.4	48.8	34.6	50.8	40.2
Prescott, Ariz	46.4	26.4	58.4	29.0	51.8	27.1	61.4	34.4	79.9	45.6	85.9	49.6	90.3	59.7	83.9	61.6	80.3	50.4	67.3	37.9	53.1	22.1	57.0	28.6
Red Bluff, Cal	54.3	39.3	64.9	44.4	62.0	43.8	67.6	48.0	78.8	54.7	92.1	64.6	97.0	66.7	95.9	65.4	89.9	61.1	72.1	49.1	63.1	39.6	(1)	(1)
Rio Grande City, Tex	62.4	42.7	73.9	51.7	79.4	60.1	87.1	66.8	95.1	70.2	97.3	75.4	97.8	75.6	99.5	76.2	89.9	73.7	86.2	64.5	77.1	54.7	75.6	48.6

[1] No record.
[2] For 25 days.
[3] Incomplete.
[4] For 20 days.
[5] Station closed November 10, 1886.
[6] Station closed August 20, 1886.
[7] For 19 days.
[8] Station closed December 31, 1886.
[9] For 29 days.

Mean maximum and mean minimum temperatures (in degrees Fahrenheit) at stations of the Signal Service, etc.—Continued.

Stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.
Rochester, N. Y	28.9	15.0	32.1	16.0	39.0	25.3	57.5	39.5	65.1	46.2	75.0	53.8	79.1	58.0	79.2	58.2	72.3	52.9	59.4	42.6	44.6	30.4	29.7	16.0
Roseburgh, Oregon	48.9	36.0	54.8	39.9	55.9	36.5	61.1	40.1	71.0	45.8	75.9	48.8	82.3	54.4	81.8	52.3	77.1	46.9	61.9	42.9	52.4	33.7	54.9	40.7
Sacramento, Cal	52.0	40.4	61.4	47.1	60.8	44.2	65.4	48.1	75.4	52.2	85.3	57.0	89.7	58.9	90.4	58.4	86.0	55.0	70.9	46.7	63.0	38.6	57.6	42.2
Saint Louis, Mo	35.0	16.2	45.8	27.4	53.5	36.8	67.2	51.6	78.2	60.5	82.3	67.1	89.1	72.1	88.5	70.4	80.4	64.0	70.3	52.4	54.5	37.8	38.5	21.3
Saint Michael's, Fort, Alaska [1]	13.4	0.4	3.3	−9.8	15.4	−3.0	28.6	9.9	38.1	27.2	49.3	36.7	....	....	....	....	....	....	....	....	....	....	....	....
Saint Paul, Minn	12.3	−4.8	25.5	4.3	35.8	19.2	59.4	39.9	71.4	48.4	76.9	56.3	83.9	62.5	82.3	59.7	69.2	48.8	65.2	41.4	36.8	19.4	16.5	−2.0
Saint Vincent, Minn	−1.1	−21.2	17.4	−6.3	28.4	6.8	55.7	32.7	68.8	40.3	76.0	47.3	83.1	55.9	79.7	50.9	63.6	38.3	58.1	33.5	30.6	8.2	8.6	−10.7
Salt Lake City, Utah	37.3	20.2	50.5	31.1	46.8	28.6	58.1	38.6	74.8	50.1	81.4	56.4	91.1	65.1	88.7	63.5	75.6	50.1	62.4	41.1	39.7	22.8	44.0	28.2
San Antonio, Tex	56.4	32.1	68.3	42.3	70.0	48.7	76.3	56.5	87.1	63.9	91.2	69.2	94.2	71.9	94.9	73.0	85.9	70.0	79.7	58.3	69.4	49.3	65.1	48.1
San Diego, Cal	62.3	49.3	68.0	50.1	62.2	48.0	63.1	51.8	67.4	54.5	69.5	58.6	73.4	62.4	77.5	65.5	72.3	62.7	66.6	53.3	65.8	48.0	63.4	49.2
Sandusky, Ohio	29.8	15.3	33.7	17.4	42.7	27.5	56.6	40.4	68.0	51.7	74.6	59.3	79.8	63.2	79.7	63.5	75.3	57.4	63.9	46.1	46.0	31.3	31.8	71.4
Sandy Hook, N. J.[2]	34.2	23.3	37.4	22.5	44.0	31.0	58.0	42.5	66.7	52.5	73.3	58.7	81.7	66.7	29.1	66.0	74.8	63.0	63.8	51.3	53.2	40.1	....	....
Sanford, Fla	62.4	45.2	67.7	48.5	70.9	54.7	74.9	59.0	85.2	65.4	89.2	71.3	88.0	72.2	88.7	73.1	87.0	73.7	78.9	67.6	73.8	54.7	67.8	49.2
San Francisco, Cal	56.5	45.8	63.8	49.9	60.7	46.6	61.7	49.2	66.4	51.8	67.8	51.1	67.7	52.8	68.7	52.6	71.0	53.8	66.1	51.1	63.7	49.0	58.9	48.4
San Luis Obispo, Cal.[3]	61.4	46.7	69.2	47.5	61.7	42.0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Santa Fé, N. Mex	34.2	15.9	44.8	23.8	47.5	24.0	56.0	33.6	73.5	47.7	77.0	52.5	84.0	59.8	77.5	56.6	69.4	48.5	61.1	40.2	45.5	23.3	45.3	24.1
Savannah, Ga	54.5	37.8	60.1	42.4	61.0	50.0	73.2	57.4	82.9	67.2	86.2	73.2	88.1	74.6	86.8	74.4	83.9	71.0	74.3	58.5	69.2	48.5	57.7	40.6
Shaw, Fort, Mont.[4]	20.4	−4.5	48.1	23.6	45.0	20.7	60.0	33.9	72.4	41.7	79.3	47.7	89.1	55.2	84.5	49.7	68.4	41.4	[5]60.3	[5]36.6	....	....	....	....
Shreveport, La	48.1	29.1	60.1	38.2	64.6	46.5	76.8	56.2	89.6	65.4	91.2	71.0	93.2	73.4	95.7	73.4	88.6	69.2	76.5	55.9	66.0	44.9	58.3	37.7
Sill, Fort, Ind. T	40.4	17.8	55.9	28.4	62.8	37.6	73.1	48.1	90.1	61.4	88.5	66.5	97.2	73.6	95.1	71.3	86.5	67.0	74.4	52.2	60.1	37.4	49.8	26.3
Sitka, Alaska	36.1	22.7	41.8	31.9	43.2	32.9	47.4	33.4	54.4	38.5	59.7	45.0	64.0	50.2	63.1	51.8	58.6	49.0	51.2	41.1	45.1	34.4	43.3	32.2
Smithville, N. C.[6]	47.1	32.6	51.4	36.1	56.9	43.1	67.5	53.9	76.9	62.7	81.4	69.2	84.6	71.9	82.2	71.7	81.1	67.1	72.4	52.9	....	....	....	....
Spokane Falls, Wash	30.7	14.9	47.0	29.6	51.0	30.8	58.8	37.9	71.0	46.2	77.4	52.4	86.9	57.5	85.9	67.2	71.6	44.3	58.0	37.9	42.9	24.2	42.3	30.3
Springfield, Ill	33.6	13.5	42.0	22.2	50.8	33.0	64.6	47.1	75.4	54.6	81.0	61.6	88.4	66.6	83.1	53.7	77.3	58.8	68.5	47.9	52.3	33.9	36.2	18.1
Stanton, Fort, N. Mex	45.7	21.7	53.6	25.4	55.1	24.9	63.0	35.5	(7)	(7)	80.3	50.2	83.8	56.1	78.9	55.8	71.3	47.7	65.7	37.2	52.4	24.9	54.5	25.8
Stockton, Fort, Tex.[8]	(7)	(7)	68.3	34.4	72.9	39.0	80.9	48.3	94.3	60.0	[9]93.2	[9]64.5	....	....	....	....	....	....	....	....	....	....	....	....
Sully, Fort, Dak	13.4	−8.6	36.0	12.0	39.2	18.5	59.6	34.5	75.4	47.8	81.2	54.6	94.0	64.0	91.0	60.0	74.7	44.7	66.1	37.7	40.7	19.2	19.2	−1.5
Tatoosh Island, Wash	43.6	35.3	48.1	40.8	47.4	39.2	50.7	42.8	56.5	46.7	60.3	49.9	63.5	53.7	61.8	52.5	59.0	49.7	54.2	46.8	48.7	41.6	49.3	42.2
Thomas, Fort, Ariz	54.6	29.0	66.0	31.5	66.6	33.2	77.1	40.5	94.3	51.0	99.0	58.4	102.0	71.7	97.6	70.2	87.6	60.2	78.5	47.3	64.4	32.5	63.4	27.3
Toledo, Ohio	27.8	13.2	33.6	17.5	42.7	26.8	58.4	40.5	70.0	49.5	76.5	57.0	82.4	60.9	79.7	61.5	74.3	55.3	63.9	44.4	44.4	30.0	28.9	14.5
Totten, Fort, Dak	−6.0	−21.2	19.6	−5.8	29.3	6.5	53.3	31.6	67.4	42.6	73.1	49.7	82.7	56.8	80.1	52.6	64.5	38.8	57.7	35.1	31.2	9.8	8.8	−8.8
Unalashka, Alaska [10]	37.2	30.6	32.0	23.8	37.9	27.8	41.7	32.3	[11]49.0	[11]37.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Valentine, Nebr	21.0	−4.7	40.3	16.5	38.5	17.8	56.7	33.8	74.6	49.8	76.7	54.9	89.7	63.3	85.4	60.1	74.1	47.1	65.8	38.2	70.2	20.1	30.3	8.0
Vicksburg, Miss	46.9	30.4	59.4	38.7	65.7	47.7	75.2	54.9	82.7	64.1	85.9	69.8	89.9	72.0	90.7	72.3	87.1	69.1	77.4	55.7	65.9	45.6	56.6	38.3
Walla Walla, Wash	33.5	19.0	53.9	35.5	54.5	36.4	63.5	42.4	75.3	49.8	81.3	56.8	90.6	64.5	88.2	61.6	77.9	52.8	60.7	40.3	50.3	31.5	47.9	33.7
Washington City, D. C	36.4	22.4	42.4	23.9	50.7	34.3	65.5	46.3	70.8	53.9	78.2	61.9	82.4	66.1	81.9	64.8	78.5	60.2	68.6	46.7	55.8	36.5	38.8	22.9
Wilmington, N. C	51.2	33.1	56.1	32.7	62.6	42.6	72.3	53.1	79.9	61.5	83.6	67.8	87.4	71.2	85.5	70.5	84.8	66.7	76.5	53.3	67.7	43.5	55.5	36.0

Winnemucca, Nev	42.2	21.4	54.4	27.5	48.6	24.4	57.2	32.3	73.4	38.8	80.7	47.9	89.0	54.8	90.3	50.2	79.7	39.9	58.6	32.3	41.5	18.8	47.6	28.6
Yankton, Dak	10.5	—4.8	34.4	11.8	36.5	20.7	59.8	38.2	75.6	51.3	80.2	57.2	89.7	65.0	85.6	33.2	74.4	52.3	69.7	42.3	41.0	20.7	23.9	4.4
Yuma, Ariz	64.9	43.8	76.2	50.2	74.1	47.2	82.1	53.8	97.0	64.8	102.1	69.5	106.7	77.2	102.2	79.5	98.7	70.7	81.3	55.2	69.7	46.6	72.5	47.3

[1] Station closed June 30, 1886.
[2] Station closed November 30, 1886.
[3] Station closed April 19, 1886.
[4] Station closed October 27, 1886.
[5] For 27 days.
[6] Station closed October 31, 1886.
[7] Incomplete.
[8] Station closed June 20, 1886.
[9] For 20 days.
[10] Station closed May 22, 1886.
[11] For 22 days.

APPENDIX No. 20.

Monthly and annual mean temperatures (in degrees Fahrenheit) from reports made by voluntary observers of the Signal Service, United States Army, for the year ending December 31, 1886.

[The daily mean is generally obtained by dividing the sum of the 7 a. m., 2, and twice the 9 p. m. (local time) observations by 4; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Accotink, Va	29.7	32.6	42.7	55.8	63.1	71.7	75.0	73.5	69.1	55.4	44.8	30.3	53.6
Aiken, S. C	40.5	45.8	55.3	65.3	([1])	([1])	79.5	79.8	([1])	76.7	56.0	45.0	.....
Albany, Oregon	38.8	46.4	46.4	52.1	58.8	63.5	68.9	68.5	63.8	51.3	43.2	49.5	54.3
Allison, Kans	13.6	33.8	35.9	49.1	67.7	72.1	77.5	77.5	67.3	57.2	30.5	26.3	50.7
Altoona, Pa	27.9	32.0	40.6	([1])	63.0	69.2	73.6	71.8	65.9	54.9	43.5	31.6	.....
Alva, Fla	([1])	([1])	([1])	([1])	([1])	([1])	77.1	78.4	76.6	71.4	60.7	59.2	.....
Amherst, Mass	24.0	25.2	24.4	50.8	57.5	63.5	71.2	67.3	60.6	49.7	40.2	25.6	45.0
Amherst (agricultural station), Mass	([1])	23.1	33.5	50.4	57.3	63.2	68.8	66.3	59.5	48.9	38.3	23.0	.....
Anderson, Cal	([1])	51.8	53.7	59.6	64.5	78.7	85.5	80.0	73.0	58.5	49.0	48.8	.....
Anna, Ill	24.3	33.8	43.8	58.2	69.8	73.7	79.2	77.9	71.2	61.1	44.2	30.4	57.3
Archer, Fla	50.0	52.6	56.7	63.3	72.5	79.8	73.7	81.9	82.2	72.7	60.7	56.0	66.8
Ashwood, Tenn	25.0	27.5	49.0	59.0	65.0	73.5	78.5	80.0	68.5	60.5	53.7	33.0	56.1
Atchison, Kans	12.8	([1])	37.5	53.4	65.7	71.9	79.8	79.4	71.1	.....	.....	.....	.....
Athens, Ga	37.0	41.8	51.2	61.8	69.5	73.4	75.6	76.6	73.1	61.3	50.4	39.1	59.2
Auburn, N. Y	23.0	25.4	33.4	49.3	55.7	63.6	67.3	66.1	61.4	51.0	37.9	24.2	46.5
Austin, Tenn	30.8	35.0	([1])	55.3	70.0	74.8	77.9	77.4	([1])	59.2	47.1	35.2	.....
Austin, Tex	42.6	54.8	60.3	68.7	80.0	83.0	87.5	86.5	81.0	69.1	([1])	51.9	.....
Bainbridge Island, Wash	37.0	45.5	44.0	50.0	56.7	62.3	65.0	66.0	48.8	53.2	44.7	46.2	51.6
Bancroft, Iowa	2.3	15.7	27.4	49.0	60.7	66.4	75.1	72.8	60.6	54.0	27.6	10.3	43.5
Bandon, Oregon	42.4	43.6	41.5	([1])	([1])	55.1	55.6	54.4	51.2	47.0	43.0	48.1	.....
Belleville, Kans	([1])	([1])	([1])	([1])	([1])	81.0	88.8	87.2	73.6	68.4	43.3	([1])	.....
Bethlehem, Pa	([1])	28.1	38.8	([1])	61.3	69.0	74.4	72.5	67.8	55.6	42.7	26.7	.....
Beverly, N. J	26.7	28.3	38.5	50.6	58.0	67.8	73.5	71.6	67.7	55.9	43.8	28.3	50.9
Bird's Nest, Va	35.4	35.6	46.8	57.9	66.8	74.4	79.8	78.1	75.7	53.9	53.3	29.0	57.2
Birmingham, Ala	([1])	42.5	52.4	61.8	69.9	76.0	77.3	([1])	([1])	([1])	([1])	([1])	.....
Blooming Grove, Pa	22.1	24.4	([1])	50.2	57.5	61.9	70.2	67.6	61.6	([1])	37.4	18.4	.....
Blue Hill, Mass	23.1	23.2	30.6	45.8	54.0	61.1	([1])	65.4	60.2	49.5	40.1	25.1	.....
Blue Lake, Cal	43.0	49.5	43.1	41.0	51.6	65.0	75.2	63.6	59.6	51.4	46.8	47.9	53.2
Brattleborough, Vt	20.9	23.0	32.3	51.7	59.3	64.6	([1])	68.4	60.6	69.5	37.4	([1])	.....
Brownsville, Nebr	([1])	28.1	36.3	([1])	66.1	70.1	77.7	78.0	68.7	40.5	38.9	22.0	.....
Burlington, Vt	18.1	18.2	28.6	48.4	58.0	67.0	71.4	([1])	58.6	49.4	36.1	18.0	.....
Butlerville, Ind	([1])	([1])	([1])	([1])	([1])	73.4	76.8	75.0	61.0	([1])	41.7	27.1	.....
Carson City, Nev	34.6	42.2	38.7	47.5	59.6	67.3	70.9	72.1	59.0	46.2	32.7	40.8	51.0
Carthage, Mo	([1])	35.6	45.8	58.7	73.6	75.6	81.0	79.7	72.8	([1])	([1])	31.5	.....
Cattawissa, Pa	23.2	25.5	37.2	54.2	63.2	65.2	71.8	70.5	([1])	53.2	39.8	26.0	.....
Cedar Rapids, Iowa	10.8	21.7	28.7	51.5	62.5	71.4	77.2	78.5	64.1	53.6	33.6	16.5	47.5
Central College (Fayette), Mo	([1])	30.4	40.6	55.9	68.0	73.1	79.1	79.5	71.2	.....	.....	.....	.....
Chapel Hill, N. C	33.4	38.6	49.0	59.6	67.8	75.3	76.9	75.9	75.9	58.7	49.1	36.7	58.1
Charleston, Ill	21.0	27.5	41.0	50.6	65.3	71.5	76.1	76.1	68.1	56.6	38.9	22.6	51.3
Charlotte, Vt	14.0	16.8	25.8	54.8	55.5	64.5	69.8	68.0	60.5	42.8	44.8	18.0	44.6
Clarksburgh, W. Va	([1])	([1])	([1])	([1])	65.7	71.2	75.0	73.6	66.2	53.0	40.8	28.5	.....
Clayton, N. J	26.9	29.6	39.0	51.8	60.4	67.3	73.5	71.8	67.5	54.8	43.7	28.0	51.2
Cleburne, Tex	32.2	46.2	53.8	62.2	64.0	77.2	83.2	86.0	76.0	68.0	50.0	41.0	61.6
Cleveland, Ohio	24.3	26.7	36.6	54.5	58.1	65.8	69.9	69.4	64.6	53.6	39.0	25.5	49.0
Clinton, Iowa	13.4	([1])	32.1	51.3	61.3	70.0	75.3	73.3	63.9	52.7	33.0	16.1	.....
College Hill, Ohio	19.6	32.1	42.8	59.3	68.1	72.0	75.4	75.9	69.2	55.8	41.8	27.7	53.1
Collinsville, Ill	20.7	31.4	42.3	56.6	64.6	70.9	77.0	76.8	69.1	58.1	45.5	24.6	53.1
Colorado Springs, Colo	22.0	35.8	34.0	44.7	62.5	64.4	71.8	68.9	59.4	50.6	32.9	33.5	48.4
Conception, Mo	9.2	25.6	34.9	49.7	68.7	71.1	78.8	78.1	67.8	([1])	36.6	19.6	.....
Cooperstown, N. Y	18.3	20.0	29.0	46.0	54.0	60.8	65.6	63.7	59.0	48.0	35.5	21.0	43.4
Cornish, Me	19.8	18.9	27.9	46.1	54.6	62.9	68.3	65.8	56.8	46.7	35.2	20.0	43.6
Cresco, Iowa	4.5	14.2	26.1	48.1	60.1	([1])	([1])	([1])	([1])	51.8	26.8	9.1	.....
Crete, Nebr	6.1	26.0	30.9	50.1	65.3	68.7	75.7	75.0	64.1	57.0	32.9	18.0	47.5
Cumberland, Md	25.0	29.9	40.2	54.8	62.0	67.2	70.8	70.5	65.4	50.0	41.1	29.1	50.5
Dale Enterprise, Va	28.2	32.7	44.7	59.1	67.3	72.3	77.1	76.4	72.9	61.3	44.4	31.4	55.6

[1] No record.

Monthly and annual mean temperature (in degrees Fahrenheit), etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Deerfield, Mass	21.2	22.9	32.8	49.9	57.8	63.4	68.8	([1])	59.8	49.8	39.0	23.5	.....
Delavan, Wis	([1])	([1])	([1])	([1])	([1])	66.4	70.3	69.2	61.8	53.5	32.4	15.8	.....
Des Moines, Iowa	9.0	22.0	34.4	52.0	62.7	68.7	76.0	75.5	65.9	56.9	35.1	16.0	47.8
De Soto, Nebr	7.0	24.1	32.2	51.0	65.1	71.9	78.5	75.8	64.9	57.7	33.0	16.4	48.1
Distributing Reservoir, D. C	29.4	32.0	43.1	58.5	63.0	73.0	76.6	75.8	71.2	58.9	47.1	30.8	55.0
Dover, N. J	25.0	25.7	35.0	48.8	57.3	64.6	70.0	67.1	62.6	49.5	38.9	24.9	47.4
Drifton, Pa	20.7	36.0	31.8	49.3	56.0	62.0	66.5	63.8	([1])	49.0	37.2	21.8	.....
Dudley, Mass	22.6	21.6	32.0	50.4	53.0	64.9	73.3	70.2	63.3	58.0	46.6	22.1	48.1
Dyberry, Pa	19.9	21.5	31.2	46.5	54.4	62.4	67.0	64.5	59.9	49.0	36.6	21.5	44.5
Egg Harbor City, N. J	([1])	([1])	41.2	52.6	59.8	66.9	73.1	70.8	67.0	55.9	([1])	([1])	.....
El Dorado, Kans	([1])	32.7	40.3	56.8	70.2	71.1	80.6	([1])	([1])	59.4	41.9	27.8	.....
Embarrass, Wis	11.6	17.4	28.2	48.4	60.5	67.1	71.8	09.0	60.5	53.8	30.4	12.7	44.3
Emporia, Kans	15.5	34.1	40.7	([1])	([1])	68.2	80.0	78.8	([1])	60.0	41.1	26.1	.....
Eola, Oregon	36.3	43.4	42.8	48.9	56.0	61.5	67.4	65.7	62.2	50.0	41.1	47.0	51.9
Factoryville, N. Y	20.1	20.3	33.5	48.5	56.2	65.1	67.8	66.7	61.0	49.6	36.2	22.3	45.6
Fall Brook, Cal	53.5	58.0	52.6	56.0	62.0	65.6	69.3	([1])	([1])	57.1	54.6	53.9	.....
Fall River, Mass	26.3	27.8	33.6	47.7	55.6	63.3	69.0	66.6	63.3	51.1	43.4	28.4	47.2
Fallsington, Pa	25.8	27.8	37.0	51.2	58.2	66.0	71.8	([1])	68.2	53.6	42.1	26.4	.....
Fallston, Md	26.6	29.7	39.4	52.1	59.3	66.8	71.5	70.9	67.1	56.2	43.1	28.6	50.9
Flat Rock, N. C	([1])	35.9	43.8	56.9	62.1	([1])	([1])	([1])	([1])	53.0	43.8	33.5	.....
Fond du Lac, Wis	([1])	([1])	27.5	44.4	55.8	66.0	70.9	69.4	([1])	51.0	26.1	12.4	.....
Forsyth, Ga	41.7	47.4	54.6	64.1	72.6	76.4	79.6	79.7	78.6	68.4	56.4	46.1	63.8
Fort Scott, Kans	21.2	34.4	44.8	56.8	72.0	75.5	.....	.....	.....	.....	.....	.....	.....
Fort Wayne, Ind	23.8	29.5	39.0	55.0	64.0	69.6	73.5	72.0	65.3	54.3	44.5	26.0	51.4
Fostoria, Ohio	20.5	26.2	36.1	52.1	61.4	68.8	([1])	([1])	([1])	([1])	([1])	([1])	.....
Frankfort, Ky	27.2	30.9	43.6	56.4	66.8	71.8	76.4	75.4	69.2	54.5	41.8	28.9	53.7
Franklin, Pa	19.0	19.8	29.8	45.4	52.8	59.5	63.0	61.9	55.9	44.7	30.9	18.2	41.7
Fremont, Nebr	([1])	([1])	([1])	([1])	([1])	([1])	76.9	74.1	63.6	56.5	31.6	18.2	.....
Gardiner, Me	19.5	20.6	29.4	44.5	54.0	61.1	66.4	64.7	57.9	46.0	37.7	23.3	43.8
Garrettsville, Ohio	20.7	22.0	33.6	49.5	55.9	61.4	66.9	66.2	60.9	49.1	34.9	20.4	45.1
Geneseo, Ill	([1])	22.3	33.4	52.4	63.3	73.6	76.4	75.3	66.6	55.2	34.3	13.5	....
Genoa, Nebr	5.0	24.5	29.0	48.3	64.2	69.3	77.7	75.4	64.0	55.9	32.2	17.0	46.9
Grampian Hills, Pa	19.5	22.8	32.8	51.0	61.5	65.8	70.0	68.0	65.8	50.4	35.2	21.5	47.0
Grand Coteau, La	47.8	54.1	60.2	67.8	74.5	78.7	80.9	82.0	78.3	66.9	57.5	52.2	66.7
Great Falls Reservoir, Md	26.7	29.2	40.4	55.7	63.4	71.8	75.9	74.3	68.9	56.0	43.3	29.6	52.8
Greensborough, Ala	39.4	48.0	57.2	63.6	70.9	76.0	([1])	79.0	77.0	67.4	54.3	45.8	.....
Hartford, Conn	23.4	24.1	32.8	49.1	55.8	63.1	71.1	68.3	60.4	51.3	40.8	22.8	46.9
Hay Springs, Nebr	10.4	29.2	27.9	40.6	59.3	63.9	74.8	68.9	57.8	47.2	26.3	19.9	43.8
Helvetia, W. Va	29.0	29.0	38.6	51.5	58.4	65.1	68.2	67.0	61.9	49.6	39.5	28.9	48.9
Hiram, Ohio	21.1	23.1	34.3	50.4	68.5	65.2	70.0	([1])	63.3	53.0	36.0	22.7	.....
Humphrey, N. Y	19.3	23.0	30.4	46.0	53.7	61.1	64.3	62.3	60.2	49.2	30.6	20.1	43.3
Independence, Iowa	9.1	19.2	30.2	50.4	62.1	69.0	75.0	73.4	62.0	52.7	31.3	13.6	45.7
Independence, Kans	18.6	33.5	43.1	55.3	71.9	72.9	81.2	78.4	71.4	59.8	43.9	([1])	.....
Ithica, N. Y	21.5	24.2	32.5	49.4	56.8	65.5	69.1	67.0	61.7	50.6	37.6	23.6	46.6
Jacksonborough, Ohio	23.0	26.8	38.8	53.3	63.3	67.4	73.6	72.5	66.5	53.1	38.2	24.6	50.1
Jeffersonville, Ind	27.0	30.9	43.4	57.5	68.4	71.8	77.0	75.3	75.2	56.2	42.7	29.1	54.5
Kalamazoo, Mich	([1])	([1])	([1])	([1])	([1])	([1])	74.0	68.5	62.0	55.5	38.5	25.0	.....
Kendall Green, D. C	([1])	31.0	41.1	54.4	62.4	([1])	([1])	([1])	([1])	56.2	50.4	36.8	.....
Kent's Hill, Me	17.5	17.4	26.4	42.5	53.2	61.0	67.1	65.9	56.2	44.4	35.1	17.7	42.0
Kirkwood, S. C	34.2	38.8	50.0	60.8	69.9	70.4	78.3	75.8	72.7	58.0	48.3	39.7	58.1
Laconia, Ind	([1])	([1])	42.7	57.4	68.0	72.5	77.3	75.7	([1])	55.7	41.4	([1])	.....
Lafayette, Ind	19.1	26.2	37.8	53.9	62.3	68.9	74.0	74.0	65.8	53.7	37.2	22.5	49.6
La Grange, Ind	18.7	23.8	34.4	51.7	60.0	66.7	70.8	70.5	([1])	52.9	34.5	19.4	.....
Lansing, Mich	19.0	22.4	32.1	50.2	57.8	66.2	70.9	68.5	61.8	51.8	34.0	19.6	46.2
Lawrence, Kans	([1])	31.6	40.4	([1])	68.5	71.8	79.5	79.0	71.2	([1])	([1])	24.0	.....
Lead Hill, Ark	24.2	36.2	46.4	60.0	74.4	75.4	81.7	81.0	74.3	58.3	45.2	32.5	57.5
Leroy, N. Y	20.9	23.9	31.4	48.4	54.9	63.3	([1])	([1])	60.5	49.8	35.7	21.0	.....
Liberty Hill, La	39.0	52.5	58.0	70.5	80.7	85.5	85.0	87.5	81.8	71.0	([1])	([1])	.....
Limona, Fla	56.4	64.5	66.5	70.6	80.0	80.3	90.4	83.7	([1])	75.5	66.1	62.6	.....
Lincolnton, N. C	31.1	32.0	45.1	55.8	65.0	70.6	73.6	73.4	69.3	53.6	43.7	34.2	54.0
Logan, Iowa	([1])	22.0	32.2	52.5	65.5	70.7	77.0	76.8	70.2	([1])	31.3	([1])	.....
Logansport, Ind	22.7	([1])	([1])	57.7	66.6	72.2	76.3	74.4	68.2	56.2	38.9	24.2	.....
Lunenburgh, Vt	15.0	15.4	25.2	44.1	52.3	59.9	66.3	64.5	56.5	47.4	33.3	15.4	45.4
Madison, Wis	11.9	19.7	28.9	47.0	59.3	67.6	73.8	73.1	60.8	52.4	31.2	14.2	45.0
Mahanoy Plane, Pa	24.8	28.6	39.2	55.7	62.4	72.8	77.9	76.5	68.0	55.8	([1])	([1])	.....
Manatee, Fla	52.5	58.9	65.2	75.0	76.1	83.1	82.4	83.5	81.6	75.0	66.0	59.5	71.6
Manchester, Iowa	12.0	20.0	31.5	52.0	([1])	68.0	76.8	75.1	63.5	54.9	([1])	([1])	.....
Manhattan, Kans	11.0	30.2	38.8	54.8	([1])	72.3	81.8	78.8	70.7	58.5	35.7	23.5	.....
Manitowoc, Wis	17.2	21.2	30.6	43.8	55.6	61.7	68.0	66.4	57.1	54.1	32.9	17.4	43.8
Marietta, Cal	49.5	51.2	49.9	54.1	62.4	65.0	71.6	74.1	([1])	([1])	([1])	([1])	.....
Marion, Va	25.8	30.0	41.0	54.2	62.0	67.2	70.3	70.0	66.0	54.0	([1])	([1])	.....
Mattoon, Ill	21.5	30.0	40.5	57.0	68.0	73.0	80.0	77.0	70.6	60.0	40.5	24.7	53.6
Mauzy, Ind	19.2	23.0	34.7	50.7	62.0	66.9	74.0	69.2	61.5	46.5	31.6	20.4	46.6
Mazatlan, Mex	70.8	70.9	68.3	69.9	77.9	80.8	82.5	83.1	([1])	79.8	73.2	65.8	.....
McDonogh, Md	27.7	34.0	47.5	59.4	62.2	69.1	70.5	74.4	67.9	57.1	43.9	29.4	53.6

[1] No record.

Monthly and annual mean temperatures (in degrees Fahrenheit), etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Menand Station (near Albany), N. Y	19.7	22.5	32.2	50.2	59.4	65.3	72.9	69.2	([1])	51.0	39.1	21.6	.....
Merritt's Island, Fla	55.3	60.2	63.2	67.0	76.3	79.0	78.5	70.9	79.8	73.7	([1])	60.2	.....
Midland, Tex	36.9	47.7	52.5	64.0	77.5	80.6	([1])	([1])	72.0	64.0	42.7	42.4	.....
Milan, Tenn	27.5	30.2	47.2	58.9	69.0	72.8	77.8	77.4	71.5	57.5	46.3	34.2	56.4
Milledgeville, Ga	39.8	44.5	53.9	62.8	71.4	77.9	80.0	80.0	77.3	64.0	52.8	43.4	62.3
Milton, Mass	25.7	26.5	34.1	47.5	54.8	61.9	67.6	64.3	58.7	48.2	39.4	28.9	46.5
Minneapolis, Minn	3.8	14.3	27.5	49.2	59.8	66.5	73.1	70.4	57.7	52.0	26.2	([1])	.....
Monticello, Iowa	9.8	19.8	30.2	50.9	61.1	68.9	75.0	73.5	63.0	53.0	31.7	14.2	45.9
Moorestown, N. J	25.9	27.5	37.5	50.9	58.5	66.3	72.0	70.1	66.2	54.0	43.0	28.3	50.0
Mountainville, N. Y	22.2	25.8	34.6	49.7	57.6	63.9	70.5	68.4	([1])	([1])	([1])	([1])	.....
Mount Angel, Oregon	([1])	([1])	([1])	([1])	([1])	65.3	69.8	68.2	62.6	50.0	41.5	48.0	.....
Mount Forest, Canada	24.8	([1])	26.0	42.0	55.5	63.5	56.0	66.8	49.0	50.5	36.5	20.1	.....
Mount Vernon, Iowa	10.0	21.4	33.5	55.0	66.0	73.2	78.4	([1])	66.0	56.7	33.2	14.2	.....
Muscatine, Iowa	14.2	21.2	32.4	50.3	61.2	([1])	77.2	75.4	66.4	65.6	33.7	10.6	.....
Napoleon, Ohio	22.7	27.5	37.3	52.9	62.4	69.3	74.0	71.3	64.9	54.4	39.2	24.1	50.0
Nashua, N. H	22.0	23.1	31.9	48.8	56.1	63.5	69.9	67.5	60.1	48.9	38.5	23.9	46.2
Neillsville, Wis	—1.9	6.1	19.4	39.6	49.6	57.4	62.3	([1])	([1])	([1])	([1])	([1])	....
New Bedford, Mass	27.2	26.7	33.5	46.9	53.3	62.8	69.1	66.6	62.9	51.8	43.3	29.9	48.0
Newport, Vt	14.8	14.0	24.6	45.4	55.4	62.9	67.8	65.9	50.9	46.3	33.5	15.6	41.4
New Ulm, Tex	43.6	54.2	58.7	66.6	76.1	81.7	83.4	84.0	77.8	69.1	58.7	52.7	67.2
New Westminster, British Columbia	([1])	([1])	([1])	50.3	57.3	61.8	65.2	64.4	([1])	48.4	([1])	.....	.....
Nicholia, Cal	47.8	55.0	52.4	56.6	64.1	75.4	79.8	78.2	72.2	60.0	52.0	50.0	62.0
Nennescah, Kans	14.3	32.8	41.1	57.2	72.6	74.1	80.9	([1])	([1])	([1])	40.5	27.2	.....
North Colebrook, Conn	17.6	18.5	27.9	45.7	52.6	59.0	66.2	64.2	58.6	50.1	35.2	21.4	43.1
North Lewisburgh, Ohio	24.4	28.3	40.5	55.2	65.0	69.8	78.0	73.0	68.2	55.7	39.5	30.4	52.3
North Volney, N. Y	18.0	20.7	30.3	47.0	54.1	63.3	67.3	67.9	61.1	49.8	36.8	21.5	44.8
Oakland, Cal	49.4	54.6	51.3	54.4	59.4	60.8	([1])	61.2	61.1	57.0	52.2	52.0	.....
Orono, Me	18.0	18.3	26.9	43.6	53.4	61.6	67.1	65.6	56.2	45.5	37.0	18.1	42.6
Oroville, Cal	48.2	57.1	55.2	60.3	68.4	79.1	81.2	80.2	74.2	62.2	53.8	52.2	64.3
Oskaloosa, Iowa	8.8	([1])	33.2	52.6	66.0	72.2	81.8	74.1	68.0	56.0	31.4	14.0	.....
Pacolet, S. C	34.2	39.6	([1])	([1])	([1])	73.4	([1])	75.2	73.2	59.7	48.4	37.0	.....
Palermo, N. Y	17.5	19.6	28.2	46.4	52.6	61.7	65.7	65.3	54.9	47.4	34.8	19.3	42.8
Palmyra, N. Y	([1])	([1])	32.2	49.2	([1])	68.1	69.8	69.5	([1])	52.0	37.1	([1])	.....
Paramaribo, Dutch Guiana, South America	78.2	78.6	78.9	79.5	79.4	79.0	78.8	80.4	([1])	89.2	80.1	78.8	.....
Paris, Tenn	29.2	34.4	54.5	56.2	72.0	76.7	([1])	([1])	([1])	([1])	([1])	([1])	.....
Parkersburgh, W. Va	26.4	30.5	40.6	55.2	62.7	68.0	68.9	72.0	66.0	52.8	40.8	29.6	51.3
Patterson, N. J	27.0	28.5	37.3	49.8	60.0	([1])	73.4	([1])	([1])	56.0	43.0	28.0	.....
Pekin, Ill	([1])	25.7	34.9	56.5	([1])	73.5	78.7	77.4	69.1	57.1	38.6	19.4	.....
Pentwater, Mich	19.8	22.0	29.5	45.8	51.7	59.2	66.2	66.2	60.4	50.7	34.5	.....	.....
Peoria, Ill	19.9	29.2	40.2	57.7	67.7	74.2	80.2	78.8	69.8	58.4	29.6	23.0	52.4
Philipsburgh, Pa	([1])	26.0	36.4	50.7	56.6	66.1	72.0	63.0	57.4	43.0	35.1	22.3	.....
Pierce City, Mo	21.2	34.2	42.3	55.0	70.2	71.1	78.0	77.3	71.0	59.0	43.1	.....	.....
Portsmouth, Ohio	27.6	([1])	42.6	55.3	64.5	68.8	72.8	71.8	66.9	53.5	42.5	30.4	.....
Post Mills Village, Vt	17.2	15.5	26.0	44.5	54.2	63.0	66.8	64.0	54.5	43.0	31.2	13.3	41.1
Poultney, Vt	16.7	18.0	28.0	43.5	55.5	62.4	67.6	67.0	57.7	47.8	36.0	18.0	43.2
Poway, Cal	53.1	56.0	52.0	56.2	64.6	67.2	71.0	74.2	67.7	57.0	54.1	([1])	.....
Prairie du Chien, Wis	11.5	20.4	30.9	52.1	62.3	66.0	75.4	73.4	62.3	54.1	31.5	14.6	46.2
Princeton, Cal	47.7	53.8	52.9	56.2	63.3	73.4	([1])	76.6	73.1	([1])	49.6	49.3	.....
Princeton, Mass	20.7	20.5	28.9	46.1	53.8	60.9	67.7	65.1	([1])	47.7	37.6	21.9	.....
Puerto de Luna, N. Mex	33.3	41.1	45.1	54.1	68.7	71.7	([1])	72.8	63.8	([1])	([1])	([1])	.....
Quakerstown, Pa	24.0	([1])	35.6	50.3	56.0	62.8	68.5	([1])	63.3	53.3	41.0	25.9	.....
Raleigh, N. C	37.0	39.0	49.0	60.0	68.0	75.0	80.5	78.0	76.0	62.0	52.0	39.0	59.6
Rappahannock, Va	([1])	([1])	([1])	([1])	([1])	([1])	74.6	75.7	71.2	62.3	50.3	29.8	.....
Readington, N. J	30.2	31.9	39.0	55.3	62.1	71.2	76.8	74.1	70.7	58.5	46.6	32.4	54.1
Receiving Reservoir, D. C	28.0	30.9	42.4	57.7	64.7	74.0	76.6	75.6	71.3	58.4	45.9	29.9	54.6
Reidsville, N. C	26.7	35.6	45.7	52.8	63.0	66.4	72.1	76.4	75.0	55.2	38.2	.....	.....
Richardton, Dak	([1])	16.4	24.7	43.9	([1])	68.9	76.9	69.8	([1])	45.1	25.1	7.2	.....
Richmond, Ky	26.5	31.9	42.9	55.3	64.9	([1])	([1])	([1])	68.4	56.4	42.6	30.4	.....
Riley, Ill	12.4	19.4	30.2	47.4	57.9	65.5	70.9	69.6	60.9	52.2	31.3	15.4	44.4
Rock Creek Bridge, D. C	32.4	35.1	45.6	60.2	66.6	74.8	79.1	71.1	73.1	61.2	48.5	33.9	56.8
Rockford, Ill	14.3	20.9	30.8	48.5	59.4	67.2	73.4	71.0	62.2	52.2	32.9	18.2	45.9
Ruggles, Ohio	22.7	24.9	35.3	55.8	57.6	67.2	68.2	66.0	61.9	52.3	37.7	.....	.....
Sacramento, Cal	46.6	53.0	52.6	58.4	66.2	72.3	77.4	72.2	65.9	54.8	46.0	47.3	51.1
Salinas, Kans	20.9	37.0	40.0	50.8	70.2	75.1	84.5	80.7	73.4	62.4	49.0	29.4	56.1
Salinas City, Cal	49.2	52.6	49.2	51.7	57.2	57.0	58.9	59.6	58.5	52.5	49.2	49.8	53.8
Sandwich, Ill	([1])	22.6	34.6	([1])	64.7	68.8	74.5	73.7	65.9	54.5	34.6	19.9	.....
Santa Barbara, Cal	55.0	59.6	53.1	55.7	60.5	62.0	66.3	68.2	63.8	([1])	56.3	55.8	.....
Setauket, N. Y	28.6	28.2	35.5	48.3	57.0	63.8	71.2	69.2	65.1	55.5	45.4	30.6	49.9
Somerset, Mass	26.5	27.2	35.1	50.2	59.3	67.6	74.7	70.4	66.4	52.9	43.6	28.4	50.2
Southendon, Conn	22.8	24.9	33.6	49.9	57.4	64.3	71.2	67.9	([1])	50.2	38.5	24.5	.....
South Orange, N. J	27.3	28.2	37.7	51.4	59.8	65.4	70.5	68.0	62.6	54.3	43.3	29.8	49.9
Spartanburgh, S. C	36.5	42.0	50.4	61.0	67.8	67.4	75.4	70.4	73.2	61.6	47.7	39.0	57.7
Spiceland, Ind	21.9	26.7	38.4	53.3	63.8	67.5	73.5	70.6	65.3	([1])	38.0	([1])	.....

[1] No record.

Monthly and annual mean temperatures (in degrees Fahrenheit), etc.—**Continued.**

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Springfield, Mo	21.5	33.0	42.8	53.4	68.4	([1])	78.9	([1])	([1])	58.6	([1])	33.1	.....
Stateburgh, S. C	39.0	44.7	53.1	62.6	71.5	75.0	77.5	77.2	74.1	63.0	53.7	43.9	61.3
Statesville, N. C	34.8	39.5	47.0	58.9	66.6	73.0	76.1	78.2	71.1	56.9	46.3	36.5	57.1
Sterling, Kans	13.7	30.6	37.7	53.7	69.0	71.5	81.4	76.7	67.5	57.7	([1])	([1])	.....
Stockham, Nebr	15.3	39.1	44.8	62.1	78.2	83.2	94.0	87.1	74.3	72.1	45.2	([1])	.....
Stratford, Vt	16.0	16.4	25.9	48.3	55.7	63.9	70.6	68.1	60.0	49.0	37.9	17.3	44.1
Summit, Va	27.8	32.3	42.0	54.9	61.7	69.4	73.7	72.7	68.9	56.0	44.6	29.4	52.7
Sunman, Ind	23.2	28.0	40.5	55.5	67.0	71.3	75.7	73.8	66.7	54.8	37.8	25.1	51.6
Susanville, Cal	28.2	40.2	39.0	43.9	([1])	66.0	73.0	72.0	([1])	50.0	([1])	38.0	.....
Sycamore, Ill	([1])	21.2	31.6	48.3	58.2	66.2	71.1	70.2	61.8	50.6	32.1	17.0	.....
Tacoma, Wash	35.0	43.5	43.0	47.4	57.3	60.7	66.8	65.8	59.5	50.9	40.5	44.3	51.2
Tallahassee, Fla	49.0	49.0	([1])	67.2	70.3	([1])	78.0	([1])	([1])	68.5	57.4	51.0	.....
Taunton, Mass	26.9	27.3	35.0	49.1	56.8	64.0	71.1	67.5	62.8	51.1	42.0	27.7	40.8
Tecumseh, Nebr	11.4	([1])	([1])	([1])	([1])	([1])	([1])	83.1	70.0	61.7	37.6	22.0	.....
Thornville, Mich	20.4	22.8	32.6	49.8	58.4	66.8	70.7	69.9	63.1	52.2	35.3	19.6	46.8
Tiffin, Ohio	21.5	24.8	34.4	50.3	60.4	67.7	71.3	69.4	62.5	50.1	35.6	21.7	47.5
Topeka, Kans	([1])	28.5	45.0	58.7	69.3	71.1	([1])	80.5	72.8	([1])	([1])	([1])	.....
Tremont, Nebr	6.5	22.3	34.2	49.2	64.6	69.0	76.9	74.1	63.6	([1])	([1])	([1])	.....
Troy, Pa	18.8	21.6	32.6	48.7	57.4	60.3	66.9	65.3	([1])	([1])	([1])	([1])	.....
University of Virginia (Charlottesville), Va	31.0	32.5	47.5	58.5	62.7	70.7	71.9	72.0	66.5	58.3	45.4	29.7	53.9
Upper Mont Clair, N. J	([1])	([1])	([1])	([1])	58.2	64.4	71.0	([1])	64.9	55.2	42.9	26.8	....
Variety Mills, Va	28.7	32.6	43.5	54.8	63.3	69.5	72.9	72.0	67.5	52.8	42.5	30.6	52.6
Vevay, Ind	27.0	30.6	48.4	55.9	67.3	70.5	75.4	74.9	69.3	56.6	42.7	29.6	53.6
Vineland, N. J	28.0	31.0	40.3	53.9	62.4	70.0	75.7	73.0	68.2	57.1	44.1	30.2	52.8
Wakefield, Kans	13.4	31.7	38.2	53.9	70.2	73.5	([1])	([1])	([1])	([1])	39.5	26.0	.....
Wake Forest, N. C	36.0	40.4	49.3	60.1	68.0	([1])	([1])	74.2	71.9	60.3	51.2	38.6	.....
Warrenton, Mo	([1])	28.5	40.4	56.7	66.7	72.1	75.5	77.8	([1])	([1])	([1])	([1])	.....
Wausau, Wis	8.9	16.0	26.2	45.4	55.9	64.3	70.2	66.2	55.8	49.5	26.1	10.0	41.2
Wauseon, Ohio	19.0	25.0	34.5	50.8	60.4	67.4	73.0	69.5	63.2	52.0	34.9	19.3	47.4
Webster, Dak	Zero	18.1	28.6	49.5	62.6	68.9	76.8	71.8	58.8	51.1	23.0	1.4	42.6
Weldon, N. C	54.7	38.2	48.2	59.3	63.9	73.2	77.1	75.7	72.0	58.8	49.4	36.6	58.9
Wellington, Kans	17.6	32.0	42.1	54.3	67.6	71.2	78.1	78.6	71.3	56.8	43.2	28.3	53.4
Wellsborough, Pa	23.3	25.1	36.0	52.0	62.8	65.2	69.2	67.0	60.1	51.2	39.0	23.9	47.9
Westborough, Mass	26.0	26.5	35.5	51.5	59.0	65.7	72.5	70.0	63.0	([1])	41.7	28.8	.....
West Chester, Pa	25.4	27.2	37.8	51.5	59.1	66.4	71.9	70.6	66.5	55.0	42.8	27.5	50.1
Westerville, Ohio	23.3	26.5	37.7	52.7	61.4	66.4	70.6	70.0	63.6	51.4	38.2	26.0	50.0
West Milton, Ohio	25.0	28.1	43.0	53.5	66.0	70.0	76.0	76.0	65.0	54.0	42.4	28.0	52.2
Westmoreland, Kans	14.0	26.0	38.0	([1])	68.0	73.0	83.0	79.0	71.0	59.0	36.0	.....	.....
West Union, Iowa	8.3	17.5	28.7	49.1	60.2	66.8	73.0	([1])	([1])	51.7	29.2	12.0	.....
White Plains, N. Y	26.5	27.5	35.5	50.9	59.8	65.8	71.5	69.6	65.5	55.2	([1])	27.8	.....
Wilkes Barre, Pa	23.0	26.4	35.9	52.0	58.5	65.6	70.0	([1])	63.5	([1])	39.4	24.7	.....
Williamstown, Mass	19.2	21.1	30.2	48.2	56.7	62.3	68.0	66.2	59.9	49.3	38.9	22.1	45.2
Windsor, Ill	18.5	27.7	38.2	54.5	64.9	72.7	75.7	76.3	68.6	53.6	38.2	23.1	51.0
Woodstock, Md	27.1	28.7	39.6	58.5	60.6	67.9	72.2	71.0	69.0	54.8	44.0	29.0	51.2
Worcester, Mass	21.9	22.2	30.9	47.4	([1])	61.1	68.1	66.1	58.7	48.0	38.0	24.6	....
Wyandotte, Kans	29.5	25.5	33.0	49.5	69.5	70.0	78.9	71.0	70.4	60.3	39.9	24.4	51.8
Wysox, Pa	22.3	26.6	34.2	53.5	59.8	67.1	76.0	67.7	64.0	53.0	38.1	22.6	47.1
Wytheville, Va	29.1	33.3	42.4	54.0	62.7	67.4	70.6	69.3	65.3	52.9	41.7	29.2	51.5
Yates Center, Kans	15.8	31.0	40.5	53.7	68.9	70.4	79.0	76.5	69.8	57.7	38.8	25.5	52.3
Yellow Springs, Ohio	26.3	28.2	39.3	53.8	63.1	66.9	70.6	69.6	63.6	52.6	38.7	26.1	49.9
Zionville, Pa	([1])	31.7	40.3	54.4	29.9	70.3	75.6	73.7	73.5	61.4	42.8	26.9	.....

[1] No record.

APPENDIX No. 21.

Monthly maximum and minimum temperatures and annual range of temperature (in degrees for the year ending

[From self-register

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Accotink, Va	62	— 9	68	— 4	72	16	87	36	84	47	94	58
Aiken, S. C	66	6	69	12	80	28	84	35	([1])	([1])	([1])	([1])
Albany, Oregon	57	18	65	32	72	30	73	39	84	40	91	54
Allison, Kans	54	—16	67	0	78	2	83	20	98	37	96	54
Altoona, Pa	58	— 3	55	3	66	10	([1])	([1])	87	40	92	44
Alva, Fla	......	......	......	......	......	......	......	......	......	......	......	......
Amherst, Mass	49	—10	49	— 6	61	3	83	31	81	43	82	51
Amherst (agl. sta. Mass.)	([1])	([1])	52	—11	61	— 1	83	21	82	29	82	42
Anderson, Cal	([1])	([1])	66	33	([1])	([1])	92	35	96	52	104	66
Anna, Ill	57	—14	59	— 7	80	21	84	27	90	45	93	53
Archer, Fla	79	14	78	23	84	26	90	37	90	50	82	66
Ashwood, Tenn	57	— 7	63	— 8	78	20	83	32	86	44	89	58
Atchison, Kans	38	—19	([1])	([1])	74	10	84	22	93	45	93	54
Athens, Ga	65	1	69	10	74	25	80	31	91	41	87	60
Auburn, N. Y	([1])	—17	55	—11	63	— 2	77	33	77	35	71	54
Austin, Tenn	50	—19	64	—22	([1])	([1])	85	28	91	44	92	60
Austin, Tex	73	6	85	25	83	34	86	36	98	60	102	67
Bainbridge Island, Wash	54	16	66	29	70	26	70	36	83	40	90	46
Bancroft, Iowa	34	—28	44	—32	55	— 2	84	12	86	30	95	40
Bandon, Oregon	54	26	58	30	55	28	67	34	63	32	70	47
Bar Harbor, Me	46	—13	48	—12	56	— 9	76	25	78	34	78	45
Belleville, Kans	......	......	......	......	......	......	......	......	......	......	94	65
Beloit, Wis	([1])	([1])	44	—22	68	2	([1])	([1])	([1])	([1])	91	42
Berlin Mills, N. H	38	—28	49	—30	51	—14	79	22	79	37	91	32
Bethlehem, Pa	([1])	([1])	55	— 4	68	9	85	32	86	47	83	43
Beverly, N. J	57	— 4	62	— 4	68	12	85	30	83	40	90	52
Birdsnest, Va	57	10	60	2	76	19	89	40	87	51	97	62
Birmingham, Ala	62	0	65	10	76	23	83	31	88	44	92	60
Birmingham, Mich	49	—11	45	—20	54	4	80	17	87	32	89	41
Blooming Grove, Pa	52	—15	61	—12	62	— 2	83	26	84	40	86	48
Bloomington, Ill	55	—24	52	—17	75	12	81	20	86	43	88	49
Blue Hill, Mass	51	—15	55	—10	59	— 3	79	24	82	34	81	48
Blue Lake, Cal	62	25	71	27	71	26	80	29	85	30	87	43
Bowling Green, Ky	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	92	47	([1])	([1])
Brattleborough, Vt	56	—17	52	—14	57	— 3	83	24	85	32	85	40
Brownsville, Nebr	([1])	([1])	66	—17	67	2	([1])	([1])	([1])	([1])	93	49
Buckfield, Me	50	—16	58	—16	48	—11	80	25	80	39	......	......
Burlington, Vt	54	—20	50	—21	66	— 9	80	21	77	40	82	45
Butlerville, Ind	......	......	......	......	......	......	......	......	......	......	90	52
Carson City, Nev	62	8	68	20	70	19	74	20	88	28	96	34
Carthage, Mo	([1])	([1])	65	—10	82	17	87	26	98	45	98	51
Catawissa, Pa	60	—13	56	— 6	68	1	82	26	84	42	86	44
Cedar Rapids, Iowa	40	—28	48	—24	68	6	82	20	90	36	94	43
Central College (Fayette), Mo	([1])	([1])	58	—14	80	21	84	24	93	43	93	49
Centralville, Mo	57	—22	85	—16	77	19	84	19	101	33	([1])	([1])
Chapel Hill, N. C	63	2	67	3	80	24	93	33	93	46	93	54
Charleston, Ill	55	—18	55	—14	78	11	84	25	91	39	92	41
Charlotte, Vt	48	—20	48	—24	66	—10	82	22	77	44	82	50
Clarksburgh, W. Va	62	—10	66	4	([1])	([1])	90	30	84	35	98	40
Clayton, N. J	49	0	60	— 2	70	13	86	31	84	43	91	47
Cleburne, Tex	72	— 3	84	10	82	27	86	28	94	52	98	59
Cleveland, Ohio	54	— 8	56	— 6	66	7	82	24	80	36	90	44
Clinton, Iowa	46	—26	49	—25	71	— 5	82	4	88	34	96	42
Clyde, Ohio	68	—10	62	—10	65	20	([1])	([1])	([1])	([1])	92	59
College Hill, Ohio	56	—18	73	—12	80	12	92	27	96	43	97	54
Collinsville, Ill	55	—13	58	— 9	80	20	84	26	90	40	89	42
Colorado Springs, Colo	60	—20	66	3	60	— 4	75	20	86	34	85	45
Conception, Mo	39	—26	52	—22	74	4	80	18	87	43	89	50
Cooperstown, N. Y	54	—24	50	—18	68	—10	75	24	75	40	79	44
Cornish, Me	46	—12	47	—11	49	— 8	77	21	81	40	85	51
Cresco, Iowa	30	—33	39	—30	50	— 9	80	15	82	40	([1])	([1])

[1] No record.

APPENDIX No. 21.

Fahrenheit), from reports made by voluntary observers of the Signal Service. U. S. Army, December 31, 1886.

ing instruments.]

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
99	65	93	58	89	45	81	33	72	22	56	2	108
92	65	94	63	([1])	([1])	89	60	78	31	66	20	....
93	57	95	53	98	48	77	36	62	24	64	39	80
106	63	108	49	104	30	94	17	67	1	68	— 2	124
95	53	90	49	88	40	80	30	70	15	53	8	....
94	71	95	70	93	68	88	55	82	43	83	34	....
95	55	88	50	85	38	76	24	65	24	48	5	105
93	41	90	39	84	32	78	17	65	16	49	1	....
114	65	107	62	106	50	93	38	86	30	73	31	....
98	59	98	51	92	51	83	34	74	22	56	6	112
96	74	97	69	92	76	92	38	86	32	78	24	83
96	60	98	62	90	47	82	33	73	30	61	5	106
103	64	105	54	91	42	([1])	([1])	([1])	([1])	([1])	([1])	....
93	58	94	60	88	57	84	33	72	27	57	16	93
89	48	87	47	86	41	73	33	65	21	47	— 3	....
96	58	96	64	([1])	([1])	86	32	74	19	63	10	....
104	70	103	73	96	59	89	42	84	24	24	20	103
88	52	87	46	82	42	72	40	62	28	62	30	74
98	51	98	34	90	32	84	20	71	— 4	42	—24	130
70	48	71	40	71	38	62	32	59	26	57	32	45
91	36	90	47	82	37	75	26	58	24	52	—10	104
99	78	101	56	93	58	86	41	70	17	([1])	([1])	....
95	44	([1])	([1])	([1])	([1])	80	27	66	10	([1])	([1])	....
94	33	90	34	86	26	75	13	60	— 2	49	—22	124
98	59	93	55	90	42	84	29	72	24	49	4	....
92	59	92	56	88	36	80	29	71	22	53	6	96
91	71	93	66	93	59	85	48	79	29	61	19	95
90	71											
([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	43	— 9	....
96	54	96	50	88	42	78	24	70	9	50	0	111
([1])	([1])	94	58	89	38	78	30	([1])	([1])	64	16	....
([1])	([1])	88	50	82	38	77	25	63	22	51	3	....
98	60	94	40	98	37	85	28	69	29	60	30	73
([1])	([1])	95	60	91	45	83	39	73	30	([1])	([1])	....
([1])	([1])	93	42	88	32	79	18	67	14	([1])	([1])	....
98	62	102	53	97	43	88	31	74	12	54	— 8	....
95	50	89	48	84	34	76	26	67	20	48	—12	116
94	58	95	55	89	40	85	32	76	17	63	— 4	....
98	37	98	39	90	31	77	18	60	4	64	16	94
100	58	100	53	92	44	([1])	([1])	([1])	([1])	60	—10	....
93	50	91	50	88	42	80	27	71	8	52	0	106
98	56	96	40	90	30	82	22	69	8	50	—20	126
99	58	105	50	97	43	82	27	71	17	60	— 8	....
100	49	103	43	94	39	80	19	71	13	66	— 6	....
98	62	96	55	94	52	89	35	77	24	64	15	96
100	53	102	50	96	43	88	30	74	14	53	— 9	120
97	56	91	52	88	38	76	30	68	20	40	—10	121
94	35	88	49	85	40	72	28	71	18	57	2	....
98	52	96	51	95	42	88	24	72	20	60	2	100
101	70	98	64	92	56	86	29	84	18	78	14	104
92	51	90	49	87	42	80	35	71	20	53	0	100
100	48	98	46	95	32	86	24	75	7	53	—30	130
97	60	92	58									
102	61	103	57	93	43	93	36	83	14	46	5	121
98	56	101	51	93	44	82	31	73	18	53	— 4	114
94	44	89	45	84	28	76	22	66	4	61	1	114
98	56	100	50	93	40	([1])	([1])	72	8	55	—18	....
89	48	85	48	85	37	72	29	64	16	46	— 3	113
92	53	90	49	86	35	76	20	62	14	46	— 7	104
([1])	([1])	([1])	([1])	([1])	([1])	81	22	65	— 1	43	—32	....

[1] No record.

Monthly maximum and minimum temperatures and annual

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Crete, Nebr	40	—25	63	—17	63	— 8	82	17	91	39	90	42
Cumberland, Md	56	— 6	52	— 6	68	12	80	30	80	42	82	45
Dale Enterprise, Va	60	—12	62	— 8	76	14	88	29	88	43	92	52
Deerfield, Mass	54	—20	49	—12	59	— 2	83	24	86	30	88	40
Delavan, Wis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82	55
Des Moines, Iowa	42	—27	53	—29	73	6	82	17	90	33	96	40
De Soto, Nebr	35	—25	57	—28	59	0	85	17	95	36	95	40
Distributing Reservoir, D. C	56	— 3	66	— 2	70	17	86	37	84	48	89	55
Dover, N. J	57	—10	60	— 7	66	9	84	27	84	36	83	41
Drifton, Pa	60	—12	59	—12	65	— 3	82	23	85	36	86	32
Dudley, Mass	40	—12	60	—16	57	—12	78	25	83	25	86	49
Dyberry, Pa	51	—18	50	—13	62	— 6	79	23	81	33	86	38
East Portland, Oregon	50	10	60	26	68	26	70	38	88	36	92	50
Egg Harbor City, N. J	(1)	(1)	(1)	(1)	68	15	90	32	85	40	91	40
El Dorado, Kans	(1)	(1)	63	— 3	78	5	83	22	92	41	92	48
Elyria, Ohio	.....	.....	.....	.....	.....	.....	.....	.....	83	41	89	46
Embarrass, Wis	36	—30	50	—30	55	0	80	10	88	36	92	48
Emmittsburgh, Md	56	— 3	56	— 4	62	14	(1)	(1)	(1)	(1)	(1)	(1)
Emporia, Kans	42	—19	62	— 8	80	10	81	18	94	42	92	48
Eola, Oregon	55	14	60	30	64	28	69	35	79	42	83	50
Factoryville, N. Y	50	—18	52	— 8	65	4	80	24	82	34	88	42
Fairbury, Nebr	40	—24	65	0	62	18	84	30	94	(1)	97	70
Fall Brook, Cal	79	31	84	39	76	39	79	44	92	42	97	53
Fall River, Mass	47	— 5	55	— 5	68	11	75	26	82	35	80	50
Fallsington, Pa	56	— 3	63	— 5	65	12	81	29	81	45	82	56
Fallston, Md	55	— 1	55	— 6	68	12	84	32	82	42	86	51
Flat Rock, N. C	(1)	(1)	58	14	71	20	78	28	87	40	(1)	(1)
Fond du Lac, Wis	(1)	(1)	(1)	(1)	50	— 2	78	— 5	89	28	93	31
Forsyth, Ga	68	6	76	13	80	30	86	36	90	50	91	66
Fort Madison, Iowa	48	—20	53	—23	72	7	80	25	87	49	93	50
Fort Scott, Kans	54	—16	65	— 8	82	17	87	28	95	53	98	56
Fort Wayne, Ind	53	— 7	57	— 3	75	13	85	26	85	40	92	45
Fostoria, Ohio	50	—11	66	— 8	81	5	86	25	90	*44	93	49
Frankfort, Ky	59	—20	59	—14	77	19	85	28	88	41	89	49
Franklin, Pa	56	—17	50	—18	64	0	78	18	80	32	86	36
Fremont, Nebr	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gallinas Springs, N. Mex	61	0	67	25	70	22	79	30	91	45	95	51
Gardiner, Me	49	—24	46	—10	48	— 9	74	22	78	33	81	44
Garrettsville, Ohio	53	—19	56	—20	73	0	81	16	85	28	89	33
Geneseo, Ill	50	—22	50	—22	73	3	80	10	85	36	89	43
Genoa, Nebr	39	—27	60	—17	61	— 7	82	15	92	40	92	42
Germantown, Pa	52	— 3	63	— 8	64	10	84	31	78	44	81	54
Grampian Hills, Pa	50	—20	56	—14	64	4	82	24	84	40	86	44
Grand Coteau, La	70	11	73	21	78	36	84	40	91	56	92	69
Grand Turk Island, British West Indies	(1)	(1)	(1)	(1)	84	78	85	80	85	82	(1)	(1)
Great Falls Reservoir, Md	56	— 6	65	— 2	68	13	88	32	88	47	86	57
Greensborough, Ala	65	2	75	14	78	34	82	37	88	54	88	66
Harrisville, Mich	51	—13	49	—27	48	1	78	5	85	28	85	33
Hartford, Conn	54	—18	54	— 8	62	1	84	27	85	33	85	42
Hay Springs, Nebr	50	—31	63	— 5	68	—15	78	5	93	25	(1)	33
Heath, Mass	50	—20	52	—18	50	— 6	(1)	(1)	(1)	(1)	84	42
Helvetia, W. Va	62	—10	62	—24	71	— 2	84	28	84	32	86	42
Hiram, Ohio	52	—10	56	—12	72	4	80	25	82	32	88	47
Hudson, Mich	49	—17	52	—26	73	5	83	12	87	33	95	37
Humphrey, N. Y	49	—11	49	—14	60	— 6	74	20	80	34	90	47
Independence, Iowa	35	—26	41	—21	60	2	76	21	82	46	88	52
Independence, Kans	40	—14	67	—10	83	14	89	24	98	44	96	54
Ithica, N. Y	54	—11	53	—10	66	— 3	79	22	79	36	90	41
Jacksonborough, Ohio	58	—19	58	—12	70	12	86	26	90	38	94	48
Jeffersonville, Ind	60	—12	59	— 4	76	20	84	30	88	44	90	50
Kalamazoo, Mich	52	— 6	50	— 9	68	7	80	19	81	37	88	46
Kennewick, Wash	53	—16	72	16	76	15	76	24	97	34	104	46
Kendall Green, D. C	56	— 4	64	— 4	66	15	84	35	82	46	(1)	(1)
Kent's Hill, Me	47	—18	48	—15	43	—11	79	23	79	34	82	45
Kirkwood, S. C	42	— 1	61	8	72	24	81	37	88	52	83	67
Laconia, Ind	59	—13	60	— 7	80	20	92	26	84	47	95	47
La Fayette, Ind	54	—23	55	—15	76	10	82	19	88	34	93	39
La Grande, Oregon	.....	.....	.....	.....	.....	.....	.....	.....	88	49	90	42
La Grange, Ind	52	—17	52	—13	73	7	80	18	82	34	88	42
Lansing, Mich	50	—12	51	—18	67	5	80	16	82	33	91	40
Lawrence, Kans	(1)	(1)	62	— 7	79	11	(1)	(1)	91	44	92	49
Lead Hills, Ark	58	—13	73	—11	88	24	91	29	100	44	101	52
Le Noir, N. C	60	—12	56	4	(1)	(1)	83	32	85	42	84	57
Le Roy, N. Y	48	— 7	57	— 5	67	0	80	21	78	36	89	39
Liberty Hill, La	70	5	68	28	75	40	79	50	91	62	90	77
Limona, Fla	82	23	84	32	92	36	93	47	97	54	102	69
Lincolnton, N. C	62	— 7	56	9	67	26	(1)	34	80	45	85	60
Logan, Iowa	(1)	(1)	(1)	—34	64	2	84	18	96	38	98	40

[1] No record.

range of temperature (in degrees Fahrenheit), etc.—Continued.

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
100	55	99	46	93	37	87	21	74	6	57	—11	126
86	60	88	50	88	44	75	34	68	14	44	8	94
95	58	95	57	93	48	88	32	78	21	50	7	107
95	42	(1)	(1)	86	34	78	20	65	17	50	0	....
94	57	90	45	88	32	81	24	63	5	50	—24	....
101	52	100	42	95	37	86	23	70	5	54	—28	128
103	55	100	49	94	38	90	23	73	4	49	—13	131
89	63	90	58	88	50	80	35	70	25	46	13	93
93	48	94	42	88	36	83	21	76	17	54	8	104
94	48	91	45	(1)	(1)	77	22	69	10	50	1	....
94	58	92	40	83	50	79	36	68	10	50	1	110
93	42	90	42	87	34	75	22	61	3	44	1	111
90	50	88	50	90	38	70	37	56	26	60	28	64
94	50	92	48	93	44	82	20	(1)	(1)	(1)	(1)	....
101	51	(1)	(1)	(1)	(1)	82	24	73	12	59	— 4	....
95	52	92	51	90	39	83	32	73	20	55	— 4	....
96	56	92	46	90	38	82	25	68	4	46	—26	126
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	70	20	46	9	....
99	60	102	56	91	41	83	33	74	15	59	— 9	121
92	53	87	56	91	47	74	34	54	26	59	37	78
97	42	91	48	90	40	77	24	64	9	46	— 4	115
100	79	100	75	94	(1)	93	42	(1)	(1)	(1)	(1)	....
102	53	(1)	(1)	(1)	(1)	84	40	86	31	84	38	....
87	51	85	46	80	40	76	26	65	25	48	8	92
92	63	(1)	(1)	87	47	80	29	71	21	50	7	....
90	56	89	54	90	46	81	33	70	23	51	11	96
(1)	(1)	(1)	(1)	(1)	(1)	75	34	67	22	54	10	....
102	40	94	35	90	28	82	20	67	—12	44	—27	....
93	65	98	68	94	59	90	42	82	33	65	33	92
100	64	96	55	91	37	82	30	(1)	(1)	(1)	(1)	....
97	54	96	47	90	45	83	32	71	18	64	0	104
95	57	92	53	94	42	88	30	76	16	64	1	115
90	44	86	40	84	34	72	28	62	8	42	0	108
105	56	97	40	90	36	85	24	71	8	52	—12	....
98	62	89	61	85	42	78	45	68	24	74	22	98
88	45	87	47	80	35	78	23	61	18	52	—10	111
98	41	93	39	91	34	79	25	70	12	51	—10	118
98	47	97	43	93	35	84	28	73	9	55	—25	123
104	56	97	43	94	38	81	21	70	5	59	—14	131
97	60	94	56	90	48	79	33	70	22	50	6	105
96	54	90	52	88	38	76	26	64	8	46	0	116
92	68	95	72	90	55	90	43	79	32	72	22	84
84	83	(1)	(1)	(1)	(1)	85	80	(1)	(1)	(1)	(1)	....
96	62	94	55	92	44	80	32	71	19	50	10	102
(1)	(1)	94	(1)	89	56	78	41	74	31	70	22	....
98	40	91	34	84	32	78	27	62	10	50	—10	125
96	44	88	42	86	34	76	19	65	18	44	2	114
100	55	98	40	92	30	83	23	54	— 5	50	—13	....
(1)	(1)	90	50	(1)	(1)	(1)	(1)	64	16	(1)	(1)	....
92	52	88	45	84	38	78	29	69	17	60	— 1	116
96	56	(1)	(1)	91	43	78	30	68	18	50	— 3	....
96	45	92	36	88	32	81	28	70	10	49	— 3	119
90	50	86	46	87	44	75	30	68	15	44	— 6	104
92	60	94	52	84	39	78	29	64	8	46	—26	120
109	59	104	58	94	42	87	28	74	13	(1)	(1)	....
96	46	92	47	90	39	75	24	67	15	48	— 4	107
99	60	96	52	90	40	80	31	62	18	60	— 4	118
90	60	93	55	89	45	82	32	73	22	60	4	105
90	70	86	51	82	42	75	36	66	11	48	— 2	99
110	50	107	46	102	29	81	24	65	8	61	12	126
(1)	(1)	(1)	(1)	(1)	(1)	79	42	68	23	50	14	....
90	46	90	51	84	32	69	22	60	14	41	—14	108
88	66	88	64	82	61	77	24	72	22	60	19	89
100	67	87	53	(1)	(1)	84	30	80	18	(1)	(1)	....
101	47	97	44	91	30	85	28	72	9	60	—17	124
102	50	97	53	89	34	80	28	(1)	(1)	51	22	....
94	51	90	42	(1)	(1)	79	31	68	14	52	— 5	....
94	46	80	38	86	36	79	31	68	5	50	—10	112
100	57	105	52	97	42	(1)	(1)	(1)	(1)	58	— 6	....
104	60	104	53	102	47	88	24	79	19	67	0	117
87	60	88	56	83	53	80	35	66	22	52	15	....
(1)	(1)	(1)	(1)	90	38	77	24	69	12	46	— 8	....
91	71	94	71	88	66	80	56	(1)	(1)	(1)	(1)	....
98	74	102	72	90	71	90	50	88	42	82	32	79
83	63	90	61	82	58	73	41	67	26	49	18	....
103	53	100	48	92	35	88	22	74	8	(1)	(1)	....

[1] No record.

Monthly maximum and minimum temperatures and annual

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Logansport, Ind	56	—17	(1)	(1)	(1)	(1)	85	26	92	43	92	44
Luling, La	71	13	75	26	80	36	85	38	89	54	92	67
Lunenburgh, Vt	42	—22	46	—25	50	—16	72	28	76	39	78	40
Madison, Wis	35	—24	43	—21	49	4	77	8	83	37	94	41
Mahanoy Plane, Pa	52	— 4	51	6	64	7	86	32	78	48	86	60
Manatee, Fla	85	23	82	33	90	41	90	51	92	64	96	70
Manchester, Iowa	37	—28	45	—20	62	5	81	17	(1)	(1)	90	42
Manhattan, Kans	40	—20	60	— 7	80	8	86	18	99	52	100	55
Manistique, Mich	42	—22	56	—28	61	—10	(1)	(1)	(1)	(1)	(1)	(1)
Manitowoc, Wis	41	—29	46	—22	45	10	76	9	86	31	85	36
Marietta, Cal	77	21	80	31	80	30	78	34	98	44	98	48
Marion, Va	58	—10	57	—12	70	16	80	28	83	38	83	54
Marquette, Nebr	35	—19	50	4	56	12	80	26	90	46	90	64
Mattoon, Ill	54	—16	58	—11	80	15	84	25	94	46	94	56
Mauzy, Ind	53	—23	55	—16	72	10	79	15	86	34	88	37
Mazatlan, Mexico	79	56	85	57	77	50	79	53	87	62	89	67
McDonogh, Md	56	— 4	62	— 8	63	9	83	30	80	41	85	51
Menand Station (near Albany), N. Y	53	—15	46	—14	61	— 3	81	26	80	47	80	56
Merritt's Island, Fla	77	26	78	38	81	42	85	49	92	60	93	42
Midland, Tex	75	— 4	84	12	88	28	86	29	101	52	103	60
Milan, Tenn	59	—11	61	—17	81	24	85	32	90	42	90	56
Milledgeville, Ga	69	6	70	13	78	26	86	31	95	43	94	64
Milton, Mass	54	—11	55	— 8	65	0	78	31	82	33	82	50
Minneapolis, Minn	31	—29	46	—29	60	— 9	81	14	83	42	91	48
Monticello, Iowa	38	—28	46	—24	67	0	82	14	89	32	95	36
Moorestown, N. J	55	— 3	64	— 4	64	12	84	28	84	46	92	44
Mottsville, Mich	42	—18	52	—18	74	7	83	18	83	34	(1)	(1)
Mountainville, N. Y	56	—14	54	— 7	66	4	83	26	84	33	82	41
Mount Angel, Oregon	......	......	......	......	......	......	......	......	......	......	90	52
Mount Forest, Canada	43	— 7	43	—34	43	9	76	10	77	34	88	39
Mount Vernon, Iowa	40	—30	51	—26	63	7	88	20	92	40	98	48
Muscatine, Iowa	45	—21	48	—21	70	0	86	51	90	36	(1)	(1)
Napoleon, Ohio	53	— 9	58	— 8	72	8	80	20	85	37	91	43
Nashua, N. H	51	23	52	— 8	61	3	84	23	85	29	85	41
Neillsville, Wis	25	—48	45	—48	43	—19	75	— 1	86	18	91	25
New Bedford, Mass	47	— 9	48	— 6	58	2	74	27	82	34	79	45
Newport, Vt	48	—28	46	—30	51	—16	79	20	73	40	84	48
New Ulm, Tex	80	7	87	23	81	34	84	38	97	54	102	66
New Westminster, B. C	(1)	(1)	52	34	55	32	66	36	78	33	88	46
Nicolaus, Cal	69	31	74	38	76	38	74	47	88	53	100	58
Nennescah, Kans	43	—16	63	— 2	89	12	85	23	99	37	95	57
North Colebrook, Conn	56	—17	54	—21	59	—10	77	25	78	32	78	43
North Lewisburgh, Ohio	53	—14	60	—11	73	6	83	20	86	40	93	44
North Volney, N. Y	49	—17	48	—17	65	— 5	78	24	79	42	85	49
Oakland, Cal	64	30	67	40	72	25	77	39	87	44	79	53
Orono, Me	48	—26	50	—21	46	—19	76	19	78	35	81	46
Oroville, Cal	66	29	70	44	75	40	82	44	90	52	95	62
Oskaloosa, Iowa	49	—27	52	—23	74	11	87	20	94	39	98	44
Pacolet, S. C	63	2	58	12	(1)	(1)	(1)	(1)	(1)	(1)	83	64
Palermo, N. Y	46	—19	49	—19	63	—11	77	25	80	38	82	46
Palmyra, N. Y	53	—12	51	— 4	66	1	78	31	81	44	90	51
Paramaribo (Dutch Guiana), South America	89	69	89	71	91	67	92	70	90	72	90	72
Paris, Tenn	62	—14	57	—14	75	24	80	32	90	54	90	64
Parkersburgh, W. Va	60	—12	64	10	76	15	84	31	86	39	87	46
Paterson, N. J	48	— 4	58	Zero.	65	13	85	33	87	39	(1)	(1)
Pekin, Ill	(1)	(1)	50	—20	79	12	83	18	(1)	(1)	95	47
Pendleton, Oregon	(1)	(1)	60	22	62	18	71	25	92	41	(1)	(1)
Pentwater, Mich	40	— 5	54	—26	60	— 3	79	3	81	22	93	27
Peoria, Ill	56	—18	52	—15	78	17	88	23	92	39	95	48
Philipsburgh, Pa	(1)	(1)	55	0	69	0	76	25	79	35	83	49
Pierce City, Mo	60	—18	64	— 9	81	19	84	25	93	43	93	50
Portsmouth, Ohio	58	—12	(1)	(1)	80	18	85	24	87	44	86	50
Post Mills Village, Vt	47	—30	44	—30	52	—12	81	20	77	38	84	42
Poultney, Vt	56	—27	(1)	—24	70	—11	84	18	83	34	85	40
Poway, Cal	77	—28	83	42	73	40	78	45	90	54	95	60
Prairie du Chien, Wis	35	—25	49	—25	58	— 8	83	19	85	41	93	31
Princeton, Cal	64	29	75	34	73	34	82	35	92	41	103	51
Princeton, Mass	49	—15	46	—13	46	— 6	78	21	79	35	79	45
Princeton, N. J	57	— 4	61	— 5	67	10	82	29	82	41	......	......
Puerto de Luna, N. Mex	63	— 7	69	14	77	21	78	32	96	52	94	56
Quakerstown, Pa	53	— 4	55	— 4	63	8	77	29	77	40	77	46
Quitman, Ga	72	13	72	21	80	33	84	40	(1)	(1)	(1)	(1)
Raleigh, N. C	65	5	69	6	81	27	89	40	93	47	91	63
Rappahannock, Va	......	......	......	......	......	......	......	......	......	......	......	......
Readington, N. J	56	— 4	58	Zero.	60	12	88	32	84	48	88	58
Receiving Reservoir, D. C	56	— 5	64	— 4	68	14	85	36	84	49	90	58
Reidsville, N. C	69	—10	63	5	80	20	92	27	96	34	97	38
Richardton, Dak	32	—40	50	—22	52	—13	75	12	(1)	(1)	88	48

[1] No record.

range of temperature (in degrees Fahrenheit), etc.—Continued.

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
103	54	98	52	90	44	86	34	74	16	57	— 8	....
91	65	94	65	90	58	88	43	([1])	([1])	([1])	([1])	....
88	50	85	49	86	37	72	29	58	10	44	—18	113
100	54	94	47	86	37	80	31	49	9	44	—26	126
96	67	94	61	88	46	77	39	([1])	([1])	([1])	([1])	....
96	75	95	75	93	76	93	53	88	42	84	38	73
98	53	98	43	92	37	85	25	([1])	([1])	([1])	([1])	....
103	62	105	60	98	37	88	22	80	8	60	— 7	125
([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	42	—24	....
98	44	92	45	80	34	72	29	56	3	43	—17	127
102	51	106	51	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	....
90	55	85	57	85	49	78	34	([1])	([1])	([2])	([2])	....
96	74	96	65	94	40	79	39	69	13	54	—10	115
104	56	102	58	96	42	86	32	76	15	54	— 8	120
93	47	88	44	85	34	79	23	67	9	58	— 5	116
92	68	92	67	([1])	([1])	89	61	81	51	79	52	....
88	56	89	54	86	47	77	31	68	22	51	10	93
92	59	88	5[illegible]	([2])	([1])	75	34	67	20	44	— 1	....
90	71	92	69	92	[illegible]	89	58	([1])	([1])	77	35	....
([1])	([1])	([1])	([1])	91	45	85	41	78	19	70	11	....
96	58	103	53	96	46	83	30	76	22	64	11	120
95	64	96	62	91	62	83	34	79	29	65	19	90
93	50	85	43	82	36	76	20	62	22	52	9	104
93	58	95	45	87	32	81	24	68	— 3	([1])	([1])	....
100	51	99	40	93	35	86	23	68	6	53	—29	129
92	60	93	52	92	46	81	22	73	22	53	8	97
94	48	92	50	90	42	82	30	70	15	52	— 8	....
94	46	92	44	......	......	......	......	......	......	......	......	....
93	56	90	54	96	43	73	0	60	24	64	37	....
90	22	79	55	65	33	74	27	.65	8	37	3	124
102	63	([1])	([1])	92	39	88	27	70	6	21	—27	....
103	52	100	47	95	34	85	26	72	9	48	—26	....
95	51	92	48	88	41	80	33	60	19	52	— 1	104
96	42	95	38	87	34	79	21	64	16	49	1	95
98	38	......	......	......	......	......	......	......	......	......	......	....
85	52	84	48	79	38	76	24	62	22	52	7	94
92	48	88	48	86	32	75	22	62	5	42	—24	122
104	67	104	64	94	62	92	42	87	28	79	18	97
80	48	83	49	([1])	([1])	68	34	......	......	......	......	....
111	62	101	58	99	54	92	41	76	31	74	31	89
103	67	([1])	([1])	([1])	([1])	([1])	([1])	73	13	62	— 5	....
89	48	88	35	82	32	75	18	64	12	47	— 2	110
98	55	94	51	91	41	83	31	69	16	62	6	112
93	53	93	54	90	42	75	31	70	21	45	— 7	110
([1])	([1])	81	54	91	50	74	82	69	38	63	36	....
92	51	90	43	88	31	75	21	58	14	47	—15	118
102	61	98	62	96	54	87	43	76	31	70	37	73
104	60	([1])	58	96	40	85	27	72	8	55	—25	....
([1])	([1])	85	67	82	64	76	41	71	30	56	17	....
90	51	89	50	84	38	79	31	63	18	43	—14	109
98	54	92	52	90	44	78	34	68	18	48	10	110
90	71	92	72	([1])	([1])	95	72	92	72	90	72	....
......	......	......	......	......	......	......	......	......	......	......	......	....
90	56	89	50	91	45	80	35	70	24	59	7	103
94	64	([1])	([1])	([1])	([1])	77	44	56	32	50	10	....
100	52	99	47	94	37	86	27	72	11	54	—19	....
105	46	100	44	......	......	......	......	......	......	......	......	....
95	33	93	32	89	33	83	16	67	—15	48	—22	121
100	55	99	52	94	44	84	32	72	17	56	—15	118
85	58	89	45	73	32	62	26	63	10	47	—10	....
98	60	100	52	94	48	88	24	76	17	([1])	([1])	....
90	56	88	54	89	46	80	35	72	23	62	6	....
96	52	93	46	86	29	76	16	66	— 6	38	—22	126
98	45	90	42	90	32	76	19	70	7	53	—15	....
101	59	98	64	99	58	83	40	83	28	([1])	([1])	....
102	59	96	47	92	36	85	24	70	8	51	—22	127
([1])	([1])	105	50	102	41	([1])	([1])	83	26	72	27	....
91	48	90	47	81	35	75	22	64	19	48	— 2	106
......	......	......	......	......	......	......	......	......	......	......	......	....
([1])	([1])	88	62	87	45	......	......	......	......	......	......	....
86	50	86	47	86	41	76	24	68	21	49	6	90
([1])	([1])	([1])	([1])	([1])	([1])	83	41	79	32	73	26	....
93	70	93	65	90	60	88	42	78	30	63	17	88
98	60	98	51	92	46	85	36	80	24	72	— 2	....
98	64	96	60	92	50	82	30	82	24	54	22	102
90	64	90	61	90	52	79	36	69	22	46	10	95
100	61	100	54	99	60	89	30	72	15	([1])	([1])	....
104	55	106	36	([1])	([1])	80	24	58	— 3	38	—35	....

[2] Incomplete.

Monthly maximum and minimum temperatures and annual

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Richmond, Ky	58	—14	60	—10	74	18	80	28	84	43	(1)	(1)
Riley, Ill	45	—26	42	—21	67	5	78	8	81	33	89	42
Rock Creek Bridge, D. C.	58	0	67	0	72	19	92	37	89	49	94	56
Rockford, Ill	47	—22	44	—20	66	— 6	77	4	82	41	88	50
Ruggles, Ohio	52	— 8	54	— 8	70	6	80	12	80	40	88	42
Sacramento, Cal	68	27	74	37	78	34	83	36	94	43	99	51
Salinas, Kans	40	—15	60	1	61	14	86	18	81	53	85	68
Salinas City, Cal	68	29	73	38	68	35	75	38	78	49	71	51
Sandwich, Ill	(1)	(1)	45	—20	72	10	(1)	(1)	85	44	92	49
Santa Barbara, Cal	85	35	70	45	71	35	74	38	80	44	86	54
Setauket, N. Y	57	2	55	— 3	65	8	79	29	80	43	80	49
Silver Falls, Tex	77	Zero.	78	19	90	19	84	23	100	44	104	64
Snowville, Va	66	— 6	59	— 5	69	17	80	23	84	39	(1)	(1)
Somerset, Mass	52	—12	58	—12	68	1	84	28	92	36	89	50
South Evanston, Ill	48	—24	48	—15	72	9	83	12	86	32	89	40
Southington, Conn	56	—18	56	—10	61	1	81	27	86	42	84	52
South Orange, N. J	60	— 2	52	— 2	62	10	82	32	84	46	86	56
Spartanburgh, S. C	62	1	49	33	57	42	80	51	74	61	86	60
Spiceland, Ind	54	—18	54	—11	74	14	81	22	89	37	93	42
Springfield, Mo	57	—20	59	—10	80	19	81	21	87	40	(1)	(1)
Stateburgh, S. C	64	6	68	14	77	28	86	35	94	49	90	62
Statesville, N. C	61	— 8	62	4	74	22	86	34	91	49	91	61
Sterling, Kans	44	—18	62	— 4	80	10	82	20	99	46	95	54
Stockham, Nebr	38	—26	68	0	68	28	84	30	96	52	92	72
Strafford, Vt	46	—26	44	—24	50	—16	78	20	78	40	80	46
Summit, Va	60	—12	66	—10	72	14	87	32	86	38	90	46
Sunman, Ind	54	—20	54	—13	74	13	84	21	88	38	87	46
Susanville, Cal	58	8	62	27	66	26	71	32	85	38	93	47
Sycamore, Ill	(1)	(1)	48	—17	70	4	76	3	82	41	88	52
Syracuse, N. Y	(1)	(1)	47	— 4	71	— 8	80	26	80	42	81	50
Tacoma, Wash	51	14	59	30	62	23	64	32	74	39	83	47
Tallahassee, Fla	72	12	72	18	72	32	83	38	90	60	92	72
Taunton, Mass	53	—17	59	— 9	65	1	84	29	89	32	85	40
Tecumseh, Nebr	46	—26	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Terre Haute, Ind	55	—11	54	— 4	76	22	81	29	85	43	85	56
Thornville, Mich	48	— 6	49	—11	54	6	83	18	84	36	92	44
Tiffin, Ohio	54	— 9	60	— 6	74	6	84	15	88	40	92	44
Topeka, Kans	(1)	(1)	66	— 9	82	9	88	19	96	50	96	54
Traverse City, Mich	41	—13	50	—30	52	— 2	82	4	85	31	90	34
Tremont, Nebr	33	—25	62	—23	56	— 6	78	16	93	41	94	44
Troy, Pa	49	—23	48	— 7	62	— 4	77	25	83	38	80	42
University of Virginia (Charlottesville), Va	59	12	63	— 7	66	32	78	39	85	41	80	62
Upper Mont Claire, N. J	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	81	40	80	48
Variety Mills, Va	62	—12	62	—16	75	16	86	26	86	39	88	48
Vermillion, Dak	41	—30	60	—26	58	—10	81	18	92	39	91	40
Vevay, Ind	60	—14	60	— 6	79	17	85	28	89	43	86	51
Vineland, N. J	60	— 2	60	—10	66	15	73	32	84	42	86	55
Voluntown, Conn	(1)	(1)	(1)	(1)	54	1	82	30	84	42	83	54
Wakefield, Kans	40	—17	64	— 5	69	10	91	21	97	46	99	54
Wake Forest, N. C	65	2	68	3	79	25	88	32	91	45	(1)	(1)
Warrenton, Mo	(1)	(1)	58	—16	82	18	83	25	88	48	90	56
Wausau, Wis	35	—38	50	—35	52	—11	78	4	86	26	90	33
Wauseon, Ohio	52	—14	57	—18	75	5	84	14	89	32	95	36
Webster, Dak	44	—40	61	—24	69	— 9	81	0	93	29	95	42
Weldon, N. C	63	8	68	7	79	25	89	41	88	48	94	61
Wellington, Kans	49	—17	66	—10	81	14	85	19	95	41	91	54
Wellsborough, Pa	52	—15	52	—10	68	4	82	30	84	40	86	45
Westborough, Mass	55	—10	56	—10	65	4	83	27	86	32	86	41
West Chester, Pa	56	— 3	62	— 5	66	8	83	27	82	39	86	50
Westerville, Ohio	54	—12	60	—10	73	10	80	13	84	38	88	40
West Leavenworth, Kans	50	—18	63	— 8	80	13	85	26	92	43	82	52
West Milton, Ohio	59	—14	62	—10	74	12	86	22	92	39	94	46
Westmoreland, Kans	44	—20	59	—10	80	8	82	11	94	44	96	43
West Union, Iowa	34	—31	42	—26	56	— 2	80	16	88	39	95	46
White Plains, N. Y	55	— 5	52	— 9	58	3	76	35	82	49	78	54
Wilkes Barre, Pa	57	—13	57	— 8	68	3	85	24	85	38	90	41
Williamstown, Mass	64	—17	54	—17	64	— 5	76	23	77	34	76	42
Windsor, Ill	54	—17	54	—12	77	10	83	22	91	37	95	48
Woodstock, Md	56	—13	63	— 7	67	10	84	28	85	38	87	44
Worcester, Mass	50	— 8	48	— 9	59	— 1	76	28	79	41	77	52
Wyandotte, Kans	41	—18	62	—11	78	12	80	19	90	49	94	46
Wysox, Pa	53	—14	54	— 3	66	3	79	28	81	38	84	50
Wytheville, Va	59	— 8	62	— 7	70	18	80	27	84	36	85	48
Yates Center, Kans	47	—16	66	— 8	86	9	82	24	92	41	91	47
Yellow Springs, Ohio	58	—14	61	—13	74	10	83	19	86	40	84	43
Zionville, Pa	(1)	(1)	56	— 2	60	8	86	30	84	42	86	50

[1] No record.

range of temperature (in degrees Fahrenheit), etc.—Continued.

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
(1)	(1)	(1)	(1)	86	44	81	32	70	19	59	4	....
95	49	93	45	85	34	80	26	65	9	50	—23	121
96	66	93	60	93	52	84	38	74	24	50	14	96
94	55	90	50	86	37	80	27	67	12	49	—18	116
92	52	90	48	90	41	75	28	68	20	....	....	....
103	51	99	49	91	44	80	36	68	27	63	26	77
88	76	102	60	94	51	80	42	64	18	52	— 2	117
76	52	78	54	88	46	69	39	80	30	77	32	59
99	60	96	52	90	39	84	29	70	11	58	—22	....
83	52	85	53	79	48	(1)	(1)	83	38	42	40	....
91	54	85	53	80	45	76	31	67	27	56	11	94
107	60	103	56	92	42	82	42	78	12	73	8	104
87	59	85	53	84	46	78	28	63	21	53	3	....
95	52	92	47	89	38	81	24	68	22	57	6	107
98	43	96	44	89	33	84	25	71	9	56	—21	122
96	57	90	49	(1)	(1)	78	30	69	17	50	2	....
92	58	88	54	86	46	78	28	72	26	48	14	94
86	66	81	69	84	65	75	48	61	40	46	34	85
94	52	91	48	87	40	(1)	(1)	68	14	(1)	(1)	....
92	61	(1)	(1)	(1)	(1)	79	21	72	15	58	4	....
92	64	96	60	88	60	82	38	73	30	65	22	90
92	62	91	60	88	58	78	37	70	25	55	18	100
103	64	102	58	92	39	82	32	(1)	(1)	(1)	(1)	....
104	80	100	70	94	60	86	48	72	22	(1)	(1)	....
90	48	88	48	84	32	73	20	60	22	44	—14	116
97	58	95	48	95	42	82	28	70	19	58	1	109
94	56	90	50	86	38	78	29	68	12	53	— 3	114
99	59	97	68	(1)	(1)	73	32	(1)	(1)	54	20	....
100	53	96	44	87	32	81	27	67	9	53	—24	....
(1)	(1)	(1)	(1)	91	48	78	31	(1)	(1)	(1)	(1)	....
83	55	82	52	76	40	64	34	58	29	60	32	69
89	72	94	70	(1)	(1)	80	44	79	33	72	25	....
95	45	92	45	87	35	84	21	70	21	54	5	112
(1)	(1)	104	50	95	38	88	30	72	8	57	— 8	....
96	58	91	60	87	45	79	32	67	18	55	27	107
96	50	92	49	90	39	79	35	70	9	47	—12	108
98	51	93	49	90	41	81	31	69	20	53	— 2	107
(1)	(1)	107	54	101	41	(1)	(1)	(1)	(1)	(1)	(1)	....
101	44	95	48	91	35	81	27	70	3	46	— 7	125
105	56	97	40	90	36	(1)	(1)	(1)	(1)	(1)	(1)	....
86	56	82	50	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	....
82	62	83	66	80	53	72	44	63	36	60	9	92
90	55	88	52	85	43	79	26	67	20	51	3	....
93	56	93	54	89	45	81	30	69	18	53	6	109
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	72	— 1	(1)	(1)	....
98	58	93	55	91	46	85	33	75	19	60	4	110
91	56	90	58	86	52	77	34	68	24	58	10	101
92	62	(1)	(1)	86	36	78	30	68	24	54	1	....
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	75	16	58	— 4	....
(1)	(1)	93	56	93	52	85	35	75	22	59	13	....
98	64	101	60	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	....
97	40	90	39	88	30	77	21	65	— 3	40	—24	135
99	46	95	43	90	36	84	29	71	17	56	— 5	117
102	53	106	31	97	16	85	20	63	—16	44	—37	146
93	65	95	63	92	56	83	40	78	26	66	8	87
105	58	100	55	95	38	84	23	70	5	62	— 4	122
96	48	93	48	88	34	75	30	63	10	45	— 6	111
98	50	95	38	87	32	81	20	70	18	46	4	108
92	54	91	53	90	45	80	27	72	20	50	6	97
92	51	88	45	86	38	77	30	67	18	59	1	104
102	60	110	53	99	43	88	28	77	16	59	— 5	128
100	58	98	52	95	39	88	30	75	16	65	0	114
104	52	105	50	99	37	98	24	77	10	(1)	(1)	....
102	57	(1)	(1)	(1)	(1)	83	22	70	2	47	—28	....
86	60	83	61	82	40	75	24	(1)	(1)	51	10	....
95	46	(1)	(1)	91	38	(1)	(1)	70	13	52	0	....
88	48	85	44	83	35	72	25	65	—14	49	1	105
100	52	100	48	92	39	84	29	72	16	54	— 9	117
91	51	89	50	88	43	77	28	68	17	50	6	104
89	54	83	51	77	40	73	34	63	22	47	4	97
100	64	108	48	96	41	88	24	76	12	59	— 7	126
96	56	88	47	86	42	74	32	66	10	45	0	110
90	51	84	46	83	42	77	29	67	19	51	6	98
102	55	99	49	93	40	84	20	73	11	60	—11	118
88	54	87	48	82	41	74	30	65	16	56	— 2	102
96	68	94	64	89	56	84	32	80	30	42	12	....

APPENDIX No. 22.

Monthly and annual mean temperature (in degrees Fahrenheit) at military post hospitals, for the year ending December 31, 1886.

[The daily mean is obtained by dividing the sum of the 7 a. m., 2 p. m., and twice the 9 p. m. (local time) observations by 4; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Abraham Lincoln, Fort, Dak	−5.7	15.1	23.8	45.9	60.9	66.8	76.4	70.8	55.5	47.8	24.7	2.3	40.4
Alcatraz Island, Cal	49.1	54.2	51.2	53.2	56.6	56.0	56.5	55.5	56.8	55.0	54.4	51.9	54.2
Angel Island, Cal	50.6	57.0	53.8	55.4	60.2	63.8	62.4	62.1	62.6	57.9	55.5	53.2	57.9
Assinaboine, Fort, Mont	−1.3	29.2	28.1	47.7	60.3	68.7	78.0	70.2	54.7	46.3	...	...	...
Bayard, Fort, N. Mex	39.3	47.0	44.5	54.7	69.9	73.8	77.1	72.7	66.7	58.4	44.0	46.0	57.8
Benicia Barracks, Cal	47.8	54.1	52.0	55.2	61.3	67.9	70.3	69.8	66.8	59.6	52.6	51.6	59.1
Bidwell, Fort, Cal	32.1	42.8	38.1	44.6	57.0	65.3	71.9	72.5	62.7	47.0	35.5	39.9	50.8
Boisé City, Idaho	30.6	42.3	41.7	49.6	63.6	71.9	80.2	79.1	63.6	53.0	35.3	37.8	54.1
Brady, Fort, Mich	9.6	12.1	24 6	41.9	50.4	58.8	66.0	64.5	56.6	47.4	29.8	16.1	39.8
Bridger, Fort, Wyo	20.4	31.4	26.0	38.5	55.3	63.2	71.9	...	...	...	...	...	...
Clark, Fort, Tex	47.7	58.4	62.6	69.9	([1])	([1])	87.9	88.2	...	...	...	...	...
Columbus, Fort, (N. Y. H.) N. Y	28.0	([1])	36.8	49.7	58.4	63.7	73.1	71.8	67.7	([1])	45.1	...	...
Concho Fort, Tex	38.9	50.8	([1])	69.0	81.1	84.6	86.7	84.7	75.6	66.6	52.7	46.0	...
Coeur d'Alene, Fort, Idaho	22.8	37.6	38.7	45.9	57.0	63.4	71.5	67.6	56.2	34.1	31.9	45.0	47.6
David's Island, (N. Y. H.) N. Y	26.3	26.8	35.9	49.2	59.0	65.2	72.7	72.0	67.9	56.4	...	...	...
Ellis, Fort, Mont	12.3	33.1	27.5	40.8	55 3	61.8	70.9	68.2	...	...	...	...	...
Fred Steele, Fort, Wyo	19.0	29.8	28.7	40.1	58.7	65.3	75.4	...	...	...	...	...	...
Gaston, Fort, Cal	42.0	49.8	49.3	33.1	([1])	67.4	73.5	70.9	66.5	53.8	44.9	48.8	...
Gibson, Fort, Ind. T	([1])	([1])	([1])	([1])	74.1	74.6	82.4	80.3	75.9	62.2	47.2	34.0	...
Halleck, Fort, Nev	([1])	36.2	32.8	42.8	57.2	62.4	69.7	70.9	52.9	42.6	...	...	...
Hays, Fort, Kans	12.7	31.8	37.0	49.6	64.2	69.7	76.0	75.9	66.8	58.4	36.5	27.4	50.5
Huachuca, Fort, Ariz	41.8	50.1	49.8	56.5	70.6	76.0	80.0	75.0	68.9	62.4	54.4	49.4	61.2
Keogh, Fort, Mont	−1.3	28.5	30.4	51.2	64.6	71.3	70.7	76.0	57.8	48.5	31.2	19.0	45.7
Klamath, Fort, Oregon	27.8	37.4	34.1	41.1	51.5	58.6	64.3	61.8	52.8	41.2	31.1	34.2	44.7
Laramie, Fort, Wyo	([1])	35.5	32.4	44.8	63.6	66.7	77.2	72.4	58.9	50.2	30.5	28.8	...
Lewis, Fort, Colo	21.4	28.2	27.2	39.6	37.1	61.7	69.7	64.9	55.0	45.3	27.6	30.1	42.3
Lowell, Fort, Ariz	([1])	([1])	56.7	65.3	80.2	86.7	90.1	86.4	81.1	68.8	53.8	([1])	...
Madison Barracks, N. Y	16.3	17.1	28.5	46.2	54.9	64.5	68.5	68.0	([1])	55.4	37.3	19.7	...
Mason, Fort, Cal	52.6	57.3	56.8	58.7	63.8	62.3	61.8	62.3	61.0	57.0	54.7	55.6	58.7
McDermitt, Fort, Nev	28.9	39.5	35.2	42.5	57.3	65.2	73.3	73.4	60.6	47.4	31.6	37.4	49.4
McDowell, Fort, Ariz	49.6	57.2	55.4	63.9	81.5	88.6	95.5	92.2	84.4	68.7	53.9	54.1	70.4
McHenry, Fort, Md	30.2	31.0	42.2	54.1	61.3	([1])	73.0	72.3	69.2	58.7	46.4	31.3	...
McIntosh, Fort, Tex	49.2	59.7	66.8	75.0	83.6	86.1	90.0	90.0	80.4	72.6	59.7	57.9	72.6
McKinney, Fort, Wyo	13.9	30.6	27.8	43.8		63.1	74.2	71.6	55.8	46.3	30.2	25.2	...

Meade, Fort, Dak	7.3	30.6	(1)	43.7	61.2	67.1	78.6	77.9	58.8	42.7	30.6	20.5	....
Missoula, Fort, Mont	17.5	33.3	35.2	45.4	56.5	62.4	71.3	67.2	53.3	43.8	25.9	30.6	45.2
Monroe, Fort, Va	34.3	36.6	45.8	56.0	65.2	72.2	77.4	75.9	(1)	62.8	52.2	37.6	....
Mount Vernon Barracks, Ala	44.4	50.5	58.5	65.4	74.1	78.8	80.4	82.2	78.8	49.3	57.3	69.2	65.7
Mojave, Fort, Ariz	54.3	61.9	59.4	68.8	83.4	88.9	96.2	(1)	(1)	68.5	55.0	(1)	....
Niagara, Fort, N. Y	22.8	23.2	31.8	44.1	53.7	63.4	69.2	68.8	(1)	51.6	38.5	24.9	....
Niobrara, Fort, Nebr	9.2	28.4	29.5	46.0	64.9	69.4	80.5	75.8	61.8	51.7	29.6	19.1	47.2
Pembina, Fort, Dak	—11.9	1.1	16.9	43.8	54.9	63.3	69.7	69.9	51.2	45.4	18.9	—0.7	35.2
Plattsburgh Barracks, N. Y	16.4	15.5	26.4	45.3	55.2	63.2	69.1	67.6	58.9	47.6	34.9	18.4	43.2
Presidio of San Francisco, Cal	49.4	54.5	51.7	53.9	57.2	57.0	58.2	58.0	59.4	55.4	54.3	52.4	55.1
Randall, Fort, Dak	8.0	26.5	30.0	49.5	64.7	69.5	79.8	75.7	63.6	55.4	32.3	18.5	47.4
Reno, Fort, Ind. T	23.0	38.8	47.0	58.5	73.9	74.8	82.0	83.2	75.4	62.4	46.9	34.4	58.4
Riley, Fort, Kans	11.2	30.8	39.7	53.6	71.4	76.0	81.3	79.9	72.4	61.8	39.8	24.3	53.7
Ringgold, Fort, Tex	52.7	62.5	70.4	78.0	85.2	87.7	87.9	88.9	81.4	76.1	65.5	60.3	74.7
Robinson, Fort, Nebr	16.2	33.7	33.4	46.6	66.4	67.7	78.1	74.3	56.1	49.8	31.8	24.6	48.2
Saint Augustine, Fla	50.3	53.0	58.7	64.8	74.0	78.8	78.1	79.3	78.8	71.8	61.1	54.1	66.9
Seldon, Fort, N. Mex	41.6	47.6	51.4	62.9	77.1	80.5	83.6	79.9	70.4	60.8	45.1	44.6	62.1
Shaw, Fort, Mont	7.2	35.4	32.3	44.9	58.0	65.2	74.1	69.1	54.8	46.4	33.0	25.3	45.5
Sidney, Fort, Nebr	17.2	33.5	30.5	42.6	61.9	64.6	75.5	71.5	59.0	49.4	29.2	28.0	46.9
Sisseton, Fort, Dak	—4.6	12.1	23.4	46.1	58.4	65.2	73.8	69.7	56.2	49.1	24.4	4.1	43.2
Snelling, Fort, Minn	3.5	14.5	27.3	49.8	60.7	67.4	74.4	72.4	59.6	55.4	26.8	7.3	43.3
Spokane, Fort, Wash	19.4	36.4	41.5	49.0	58.7	68.2	76.9	(1)	60.3	48.9	32.3	35.2	....
Sully, Fort, Dak	2.4	25.5	30.0	48.4	63.4	70.5	81.6	77.0	62.0	52.6	30.8	9.9	46.2
Supply, Fort, Ind. T	21.4	37.4	43.4	55.6	72.1	73.7	79.6	79.8	71.7	61.2	42.8	31.4	55.8
Totten, Fort, Dak	—10.1	7.1	18.5	43.3	57.4	64.7	73.4	69.4	52.7	46.9	20.8	1.6	37.1
Townsend, Fort, Wash	37.7	45.4	43.8	50.2	55.5	60.4	63.2	62.6	60.3	49.5	44.0	44.7	51.4
Union Fort, N. Mex	28.9	36.4	36.5	46.2	62.7	65.8	72.7	67.0	58.9	51.3	35.8	38.4	50.0
Verde, Fort, Ariz	(1)	49.6	47.7	58.9	72.9	80.9	86.3	....	....	....	....	....	....
Walla Walla, Wash	(1)	(1)	46.5	54.2	64.2	70.7	78.7	76.5	66.2	52.2	40.4	40.4	....
Washakie, Fort, Wyo	15.3	35.8	28.4	41.9	59.2	64.4	73.7	72.0	57.5	(1)	23.6	27.2	....
West Point, N. Y	24.2	25.3	35.7	50.9	59.6	66.9	73.4	71.9	66.3	35.4	42.4	26.8	48.2
Wingate, Fort, N. Mex	27.2	35.4	34.3	45.6	62.8	67.9	73.0	67.0	59.5	49.1	31.0	37.1	49.2
Yates, Fort, Dak	— 2.4	18.4	26.9	46.8	62.4	68.4	79.2	74.1	56.6	48.6	26.9	5.8	42.6

[1] No record.

APPENDIX No. 23.

Monthly maximum and minimum temperatures and annual range of temperature (in

[From self-register

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max,	Min.	Max.	Min.
Abraham Lincoln, Fort, Dak	34	-37	62	-27	64	22	83	9	95	31	96	41
Alcatraz Island, Cal	60	40	68	40	68	41	72	45	79	47	72	48
Angel Island, Cal	68	34	79	39	80	40	78	40	90	50	93	51
Assinniboine, Fort, Mont	46	-45	63	-20	65	-19	79	0	91	11	94	48
Bayard, Fort, N. Mex	75	- 1	78	18	83	12	82	23	94	40	96	52
Benicia Barracks, Cal	63	33	66	41	71	42	73	43	85	51	86	53
Bidwell, Fort, Cal	55	- 2	64	21	62	20	72	25	84	21	92	33
Boisé City, Idaho	54	1	65	19	68	20	76	29	94	26	99	40
Brady, Fort, Mich	38	-29	47	-39	45	-20	76	0	80	29	86	33
Bridger, Fort, Wyo	38	-10	50	5	50	- 7	65	15	81	15	87	26
Clark, Fort, Tex	86	10	93	29	89	33	92	34	([1])	([1])	([1])	([1])
Columbus, Fort (N. Y. H.), N. Y	53	3	([1])	([1])	62	10	82	29	80	45	83	51
Concho, Fort, Tex	80	3	87	17	([1])	([1])	93	30	107	50	112	60
Cœur d'Alene, Fort, Idaho	45	-12	58	15	70	12	70	28	87	29	88	38
Davids Island (N. Y. H.), N. Y	45	3	56	- 4	60	20	86	29	84	42	82	49
Ellis, Fort, Mont	56	-37	66	-12	67	-14	74	20	94	22	97	32
Fred Steele, Fort, Wyo	44	-23	56	0	57	- 5	71	10	94	17	93	33
Gaston, Fort, Cal	63	10	75	26	80	27	89	34	([1])	([1])	98	43
Gibson, Fort, Ind. T	......	......	......	......	......	......	......	......	99	45	99	54
Halleck, Fort, Nev	([1])	([1])	64	10	65	10	69	20	87	20	92	31
Hays, Fort, Kans	43	-23	68	- 6	74	- 4	83	13	95	27	98	43
Huachuca, Fort, Ariz	68	7	80	28	81	25	79	34	102	47	101	47
Keogh, Fort, Mont	51	-45	57	-15	75	- 8	77	16	101	24	101	41
Klamath, Fort, Oregon	50	-13	63	15	70	10	69	17	83	11	85	23
Laramie, Fort, Wyo	53	-25	65	7	65	-11	77	11	94	34	96	39
Lewis, Fort, Colo	44	-11	57	- 3	52	2	65	16	83	29	86	36
Lowell, Fort, Ariz	([1])	([1])	([1])	([1])	91	30	91	33	109	41	110	52
Madison Barracks, N. Y	54	-26	51	-32	63	- 9	74	20	73	32	84	42
Mason, Fort, Cal	61	41	71	44	69	47	70	50	84	53	76	53
McDermit, Fort, Nev	51	- 1	63	20	69	15	69	20	87	30	95	33
McDowell, Fort, Ariz	77	12	85	32	88	29	91	33	114	42	113	52
McHenry, Fort, Md	64	3	64	- 1	69	15	84	33	83	45	85	54
McIntosh, Fort, Tex	82	19	87	27	89	41	94	40	103	56	104	63
McKinney, Fort, Wyo	55	-40	54	0	65	- 5	72	18	([1])	([1])	89	40
Meade, Fort, Dak	52	-33	68	-16	([1])	([1])	78	12	94	26	95	45
Missoula, Fort, Mont	42	-20	51	5	62	11	66	26	85	33	86	43
Monroe, Fort, Va	60	8	66	1	74	20	85	35	85	45	89	59
Mount Vernon Barracks, Ala	72	10	73	18	78	32	88	34	94	53	96	63
Mojave, Fort, Ariz	80	30	86	36	90	37	95	41	113	55	116	63
Niagara, Fort, N. Y	54	0	49	-11	51	1	78	20	78	35	84	42
Niobrara, Fort, Nebr	64	-27	78	-15	77	- 7	90	15	101	34	99	42
Pembina, Fort, Dak	24	-38	47	-38	42	-15	82	- 2	86	21	91	26
Plattsburgh Barracks, N. Y	51	-25	49	-21	62	-16	73	20	73	40	84	46
Presidio of San Francisco, Cal	66	35	73	38	74	37	80	38	82	43	77	45
Randall, Fort, Dak	53	-29	65	-21	69	- 5	84	4	97	32	99	37
Reno, Fort, Ind. T	70	-12	69	- 9	89	15	84	22	101	50	101	48
Riley, Fort, Kans	47	-25	63	- 9	80	8	87	19	94	32	100	47
Ringgold, Fort, Tex	90	18	99	33	94	50	108	55	107	66	110	57
Robinson, Fort, Nebr	56	-33	71	- 5	73	- 8	76	12	95	24	92	41
Saint Augustine, Fla	75	17	77	26	79	39	85	45	94	55	94	66
Selden, Fort, N. Mex	72	9	80	19	86	20	91	33	104	42	107	55
Shaw, Fort, Mont	50	-43	66	-21	68	-20	74	19	92	23	91	36
Sidney, Fort, Nebr	58	-20	74	8	75	-12	77	11	95	30	93	39
Sisseton, Fort, Dak	45	-44	54	-36	61	-12	79	4	86	28	88	36
Snelling, Fort, Minn	30	-36	48	-38	56	-12	82	14	83	31	94	41

[1] No record.

APPENDIX No. 23.

degrees Fahrenheit), at military-post hospitals for the year ending December 31, 1886.

ing thermometers.]

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
106	50	109	32	95	21	85	—17	63	—11	43	—34	146
67	50	69	48	89	49	74	45	72	44	62	44	49
91	52	84	52	104	51	83	42	82	39	71	42	70
109	56	97	46	86	36	82	22	......	......	......	......	......
100	55	93	53	91	44	82	39	79	17	77	23	101
97	57	94	55	96	54	81	44	69	39	62	38	64
99	39	96	39	88	32	76	25	59	11	55	20	101
112	44	102	50	92	29	87	27	61	10	61	21	111
93	39	92	36	89	30	78	23	70	— 4	45	—21	122
95	31	......	......	......	......	......	......	......	......	......	......	......
110	68	107	60	......	......	......	......	......	......	......	......	......
90	55	89	57	84	50	(1)	(1)	70	27	......	......	......
112	63	106	65	95	51	80	39	85	2	75	8	......
99	42	95	41	83	28	77	25	59	0	58	9	111
92	55	92	52	88	30	80	30	......	......	......	......	......
103	32	102	34	......	......	......	......	......	......	......	......	......
100	41	......	......	......	......	......	......	......	......	......	......	......
110	40	104	38	104	30	83	24	63	24	61	32	......
106	57	105	52	101	40	83	24	79	10	69	— 3	......
96	32	94	40	87	19	78	18	......	......	......	......	......
104	51	102	48	92	28	83	16	75	— 4	66	— 9	127
104	57	97	55	92	48	85	33	79	15	84	23	97
112	51	112	36	90	28	80	25	62	—17	55	—30	157
96	26	94	29	90	19	77	11	68	5	57	13	109
107	48	100	42	88	25	81	23	53	— 6	62	— 5	132
92	43	88	39	77	32	68	22	59	—13	58	5	105
111	68	111	67	105	49	97	32	86	15	......	......	......
85	47	87	46	(1)	(1)	80	30	65	12	45	—16	......
76	54	84	54	85	53	71	48	68	47	63	44	44
101	43	96	49	90	32	79	30	54	10	56	18	102
115	64	116	64	109	54	101	37	89	22	84	27	104
89	58	85	58	85	54	75	34	70	28	53	14	90
106	68	105	70	96	62	92	47	86	27	84	22	87
101	52	101	43	88	31	83	26	57	— 3	57	—13	......
106	55	103	32	94	33	82	21	60	—13	53	—24	......
97	47	90	44	75	29	72	21	53	— 8	50	3	117
92	60	92	62	(1)	(1)	80	44	74	30	65	16	......
95	63	102	64	97	51	91	35	81	27	71	20	92
120	69	(1)	(1)	(1)	(1)	96	43	81	29	(1)	(1)	......
91	48	90	48	(1)	(1)	76	32	65	22	48	1	......
110	56	105	35	100	31	85	18	65	— 4	62	- 18	137
96	42	101	34	88	112	83	12	58	—20	33	—35	150
95	51	92	50	87	32	72	20	63	7	48	—12	120
72	47	75	47	94	46	74	42	74	41	68	39	59
110	40	101	30	98	23	85	15	67	1	68	—25	139
108	58	108	58	100	42	86	28	84	14	67	— 3	120
103	53	104	54	99	39	87	24	77	10	59	— 8	129
109	74	108	66	103	60	96	44	91	26	87	25	92
104	50	103	38	89	26	88	12	72	—16	57	—13	137
92	69	92	69	88	64	85	47	80	38	75	31	77
110	61	102	59	98	41	86	30	75	15	72	17	101
105	44	95	35	84	29	83	19	58	21	55	—28	148
105	53	101	38	96	24	79	21	58	— 1	57	— 3	125
98	50	100	29	91	17	80	19	60	—17	40	—37	144
93	50	96	39	88	23	85	22	69	—12	38	—28	132

[1] No record.

Monthly maximum and minimum temperatures and annual range of temper-

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Spokane, Fort, Wash	46	—14	58	17	75	20	75	29	90	30	98	41
Sully, Fort, Dak	49	—29	66	—19	77	— 9	82	13	101	31	100	44
Supply, Fort, Ind. T	59	—14	74	— 6	86	8	83	21	98	45	98	48
Totten, Fort, Dak	32	—40	45	—35	43	—13	83	0	87	26	90	35
Townsend, Fort, Wash	52	9	62	25	59	26	63	33	74	35	81	41
Union, Fort, N. Mex	59	—18	69	7	71	3	74	12	89	23	90	41
Verde, Fort, Ariz	(1)	(1)	78	24	79	26	81	33	102	37	105	45
Walla Walla, Wash	(1)	(1)	(1)	(1)	77	17	76	28	90	31	93	43
Washakie, Fort, Wyo	56	—37	69	2	60	—15	66	11	88	19	90	38
West Point, N. Y	55	—13	58	—10	62	5	86	22	85	39	84	45
Wingate, Fort, N. Mex	53	—12	62	10	65	12	74	21	90	31	92	42
Yates, Fort, Dak	35	—39	63	—24	67	—20	81	10	98	32	96	41

[1] No record.

ature (in degrees Fahrenheit) at military-post hospitals, etc.—Continued.

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
106	44	([1])	([1])	94	29	83	22	63	6	58	10	....
111	56	110	39	101	30	91	23	66	1	51	—23	140
107	60	104	55	94	34	85	24	75	6	69	— 5	121
100	49	105	33	85	19	82	19	54	—12	39	—34	145
87	47	82	47	94	29	68	33	60	28	62	26	85
96	47	86	41	83	30	75	27	65	— 6	69	8	114
106	50	......	....	......	....	....	....	... .	....	......	....	....
104	52	102	52	92	36	81	32	71	18	63	13	....
99	43	99	40	90	17	([1])	([1])	54	—19	50	— 4	....
96	51	94	48	85	40	80	30	70	19	54	5	109
95	53	92	52	83	34	78	25	64	0	57	14	107
107	50	106	27	95	20	85	10	61	—21	40	—44	151

[1] No record.

APPENDIX No. 24.

Mean of the maximum and minimum temperatures (in degrees Fahrenheit) at the cotton-region stations of the Signal Service, U. S. Army, for April to October, 1886, *inclusive.*

[These means are obtained by dividing the sum of the daily readings of self-registering thermometers by the number of observations taken, one daily at 5 p. m., Central time.]

Stations.	April.		May.		June.		July.		August.		September.		October.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Atlanta, Ga.:														
Anderson, S. C	78.4	53.5	83.3	57.1	85.5	65.7	89.9	66.5	87.9	67.2	83.3	64.0	75.3	45.5
Atlanta, Ga	73.8	56.7	78.4	59.0	80.9	66.4	85.7	68.0	85.8	68.8	82.8	65.0	73.2	52.3
Cartersville, Ga	76.9	56.2	80.9	57.4	83.9	66.2	87.3	66.5	87.6	68.6	85.0	64.6	74.8	49.8
Columbus, Ga	74.6	58.7	81.4	62.0	85.4	70.9	88.2	72.3	89.4	72.7	87.3	99.5	79.0	56.0
Gainesville, Ga	77.2	52.8	81.3	55.8	83.9	35.3	88.0	65.8	86.7	67.4	84.1	63.1	74.8	46.9
Greenville, S. C	78.8	52.1	84.0	56.2	87.8	64.8	[1]92.2	[1]66.0	88.9	66.9	83.1	63.1	74.1	45.8
Griffin, Ga	76.2	57.0	82.1	60.8	85.4	68.0	87.7	69.6	88.5	70.3	85.2	66.3	75.4	52.5
Macon, Ga	78.3	56.6	85.5	59.9	88.9	69.2	90.2	70.7	90.7	71.7	88.0	67.6	76.6	52.8
Newnan, Ga	77.5	56.3	83.7	59.9	87.7	67.9	90.3	69.1	92.0	70.0	87.7	64.5	76.5	51.8
Spartanburgh, S. C	78.1	52.0	81.2	56.6	83.5	64.3	87.8	66.1	87.3	66.5	85.2	62.8	76.1	45.0
Toccoa, Ga	75.1	54.3	79.4	55.8	81.8	65.5	86.6	66.2	85.6	66.5	82.1	62.6	73.1	47.0
West Point, Ga	76.6	56.6	83.0	59.3	86.6	68.7	89.0	70.0	89.6	70.4	86.7	65.7	76.8	50.7
Augusta, Ga.:														
Allendale, S. C	80.8	57.4	81.2	60.5	87.3	69.1	89.4	70.4	88.0	70.5	85.2	67.5	76.0	53.1
Athens, Ga	79.9	53.1	85.2	57.2	88.4	66.6	93.4	67.2	91.0	68.5	86.4	63.7	[2]74.5	[2]47.0
Augusta, Ga	79.3	56.6	85.2	60.8	87.0	68.1	91.1	69.6	89.5	69.7	87.2	66.8	77.4	50.5
Batesburgh, S. C	79.3	55.2	85.1	60.5	86.9	66.9	91.3	68.0	89.4	68.4	86.5	64.9	75.4	49.9
Blackville, S. C	79.6	53.8	86.7	60.1	[3]88.8	67.9	91.7	70.0	90.9	70.0	87.2	66.3	76.4	50.0
Camak, Ga	76.7	55.3	83.7	60.2	85.2	67.1	88.3	68.8	88.0	69.8	85.2	66.0	74.9	49.3
Chester, S. C	79.4	55.6	84.1	59.8	86.5	66.3	90.6	67.9	89.9	68.5	86.8	64.7	76.1	48.2
Columbia, S. C	78.2	56.2	82.7	61.9	84.7	68.7	87.7	70.0	87.6	70.0	83.7	66.0	74.7	49.8
Greenwood, S. C	77.7	56.1	82.7	60.3	84.8	67.0	88.9	67.7	87.6	68.8	85.4	65.7	75.2	49.8
Union Point, Ga	75.5	54.5	80.1	58.9	83.0	66.9	86.6	68.1	86.1	67.8	[4]83.6	[4]64.4	74.0	48.4
Washington, Ga	79.8	53.6	84.7	58.5	88.0	67.0	91.6	68.5	90.0	68.5	86.7	65.5	70.1	50.0
Waynesborough, Ga	78.1	56.5	85.0	62.4	86.6	68.8	89.6	71.0	88.9	70.9	85.2	67.5	75.2	53.7
Charleston, S. C.:														
Branchville, S. C	77.1	54.7	84.5	61.1	87.3	68.5	89.9	70.9	89.0	70.0	86.1	65.6	76.8	50.1
Charleston, S. C	73.0	59.3	81.0	65.3	83.6	71.5	86.8	73.8	85.4	73.4	83.3	70.7	75.1	59.9
Hardeeville, S. C	78.3	55.0	86.6	59.6	88.8	70.1	91.2	71.6	90.0	71.0	87.7	67.2	77.8	52.8
Jacksonborough, S. C	77.9	56.4	86.2	54.4	88.7	64.9	90.7	65.6	89.6	64.5	87.1	61.5	[1]77.8	[1]46.8
Kingstree, S. C	76.4	52.2	84.0	57.5	[3]86.5	[3]67.6	89.6	69.4	87.1	68.4	[3]79.5	[3]54.5	[3]75.3	[3]48.7
Saint George's, S. C	79.8	54.1	86.5	57.7	89.9	66.8	[1]92.8	[1]68.8	[1]90.4	[1]68.3	[2]83.5	[2]64.6	77.9	49.9

Saint Matthew's, S. C	[5]75.5	[5]54.1	[6]80.1	[6]57.3	88.1	67.4	91.1	70.2	[1]89.8	[1]69.5	83.8	65.8	[7]75.1	[7]50.6
Yemassee, S. C	79.4	55.1	83.7	57.4	87.2	67.3	90.7	70.5	([10])	([10])	80.7	66.5	77.8	52.0
Galveston, Tex.:														
Austin, Tex	80.1	58.1	88.8	65.7	92.8	70.6	96.2	75.8	96.7	75.5	89.2	71.2	80.7	57.6
Belton, Tex	81.5	58.7	88.8	([8])	[9]92.5	66.9	96.3	70.0	96.4	68.2	88.7	67.7	79.9	54.3
Brenham, Tex	80.9	61.1	89.4	65.2	93.1	71.8	96.8	74.1	96.6	73.9	88.7	70.5	81.1	58.6
Columbia, Tex	79.0	62.5	86.5	66.0	90.6	71.7	91.4	73.0	92.4	73.2	85.6	72.6	79.8	60.3
Corsicana, Tex	81.1	54.0	89.4	62.1	91.6	65.3	89.5	66.5	96.5	67.5	89.8	60.4	([10])	([10])
Cuero, Tex	81.2	63.8	91.2	66.9	96.8	72.1	97.2	74.3	98.9	74.0	92.1	71.9	83.9	58.4
Dallas, Tex	82.5	58.7	91.4	64.7	92.5	70.9	98.2	75.6	98.7	71.6	90.0	70.8	79.3	56.8
Galveston, Tex	74.6	64.6	80.6	70.2	85.7	75.5	88.5	77.9	88.8	[1]81.0	84.9	74.2	77.0	66.4
Hearne, Tex	79.3	58.5	89.2	63.4	96.0	69.2	96.5	71.0	97.2	70.8	89.5	69.1	80.4	54.5
Houston, Tex	79.8	61.8	88.3	65.0	91.3	70.3	91.6	70.9	91.6	72.3	85.2	71.3	79.4	59.1
Huntsville, Tex	78.8	60.8	88.0	65.3	91.8	71.5	94.9	73.7	96.4	75.0	89.2	70.2	79.5	57.4
Longview, Tex	83.0	58.0	90.0	61.5	93.1	68.5	97.7	72.4	99.1	71.9	80.2	67.8	77.7	54.3
Luling, Tex	([8])	([8])	88.5	70.8	93.5	75.2	96.3	77.9	96.5	78.9	89.4	73.5	81.6	61.6
Orange, Tex	([8])	([8])	84.0	67.8	[3]89.0	[3]74.3	[3]90.3	[3]73.2	[3]91.2	[3]72.8	89.2	69.7	([10])	([10])
Sour Lake, Tex	[11]82.4	[11]64.0	87.7	63.3	90.5	69.4	94.2	72.8	94.4	69.7	88.3	70.2	79.8	55.7
Tyler, Tex	80.3	57.3	87.7	60.9	88.8	66.6	95.3	78.6	96.1	68.5	91.0	65.7	76.3	59.1
Waco, Tex	([8])	([8])	88.6	64.7	92.8	71.1	98.1	75.1	96.3	74.5	88.0	70.1	77.8	58.5
Weatherford, Tex	80.9	58.3	86.4	60.4	90.0	67.1	97.2	73.1	96.1	72.2	[12]88.9	65.3	78.2	51.9
Weimar, Tex	78.3	60.6	89.0	62.0	92.9	71.6	95.8	74.2	89.8	73.6	87.4	71.6	80.2	58.2
Little Rock, Ark.:														
Arkansas City, Ark	([8])	([8])	[3]83.1	[3]56.7	85.9	65.3	[4]91.8	([8])	92.3	64.2	85.3	60.9	[9]74.5	[9]42.4
Brinkley, Ark	([10])	([10])	85.5	60.4	87.2	66.5	92.1	[3]67.8	90.8	69.2	85.8	63.6	74.5	47.5
Devall's Bluff, Ark	([10])	([10])	83.6	58.2	84.8	64.8	[1]89.7	[1]66.4	90.6	66.6	86.3	62.4	78.1	58.2
Forest City, Ark	([10])	([10])	84.6	[1]58.9	86.9	65.4	[3]91.7	[3]68.6	[1]91.5	[1]70.4	[3]85.3	[3]64.3	[1]73.9	[11]45.1
Helena, Ark	([8])	([8])	[2]83.4	[2]61.4	86.9	67.5	92.0	69.2	91.4	[3]70.2	85.9	63.8	[7]76.5	[7]49.0
Kensett, Ark	([10])	([10])	([8])	[6]61.0	83.4	65.4	88.6	68.5	89.3	67.7	[3]85.2	[3]63.4	[3]76.1	[3]48.2
Little Rock, Ark	75.5	57.2	83.8	63.2	83.5	67.5	89.0	71.6	89.5	71.5	84.1	66.1	76.0	52.8
Magnolia, Ark	([10])	([10])	[3]89.2	[3]60.0	89.9	68.4	[1]94.0	[1]70.8	96.0	70.5	89.2	65.8	75.5	51.5
Malvern, Ark	([10])	([10])	[5]88.9	[5]55.4	87.1	64.0	91.9	67.5	92.8	64.6	87.9	60.4	75.6	53.8
Monticello, Ark	([10])	([10])	86.2	61.8	[3]87.9	[3]64.9	91.5	66.9	93.6	68.7	87.9	[4]66.4	75.5	52.4
Newport, Ark	([10])	([10])	([8])	([8])	86.0	68.0	[1]91.1	[1]70.0	90.9	71.2	86.0	64.0	76.6	48.8
Paris, Tex	([10])	([10])	[5]90.6	[5]61.8	88.8	68.1	96.0	72.2	97.3	72.1	[12]89.5	[12]66.0	76.3	55.0
Pine Bluff, Ark	([10])	([10])	87.3	62.5	86.5	68.3	[12]92.5	[12]71.1	92.9	70.2	89.2	64.5	[1]75.6	[1]50.2
Prescott, Ark	([10])	([10])	([10])	([10])	([8])	([8])	92.4	71.2	95.2	71.6	[3]88.3	[3]67.5	75.6	52.8
Russellville, Ark	([10])	([10])	[1]88.4	[1]57.1	86.1	66.8	92.7	69.0	93.0	70.0	86.9	63.6	75.0	49.0
Texarkana, Ark	([10])	([10])	88.9	61.1	89.1	62.2	93.7	62.9	[3]97.1	[3]62.3	90.1	62.0	[3]76.4	[3]46.3
Memphis, Tenn.:														
Arlington, Tenn	78.3	52.2	83.9	56.4	86.3	64.8	92.5	67.6	86.5	66.7	87.9	60.3	76.6	44.8
Batesville, Miss	77.2	56.3	84.7	59.9	83.0	69.3	87.6	70.6	88.0	72.2	83.5	66.4	72.7	51.6
Boliver, Tenn	76.2	55.7	81.4	58.7	[12]84.8	66.3	90.1	67.5	89.2	68.6	85.0	63.0	[3]75.6	[3]47.7
Brownsville, Tenn	76.6	56.4	82.5	60.2	85.4	67.0	91.3	68.6	89.9	69.3	84.7	63.8	74.6	48.8
Corinth, Miss	[13]73.9	[13]53.2	81.9	56.6	85.8	64.9	92.3	66.9	90.8	71.4	86.4	61.6	[3]75.5	[3]53.4
Covington, Tenn	77.3	56.5	82.7	60.3	85.9	66.2	91.2	67.3	89.9	68.9	85.2	62.8	74.5	47.4
Decatur, Ala	79.6	55.0	84.5	57.3	87.9	66.2	92.2	66.1	90.8	68.9	85.8	61.9	76.0	46.5

[1] For thirty days.
[2] For twenty-eight days.
[3] For twenty-nine days.
[4] For twenty-five days.
[5] For twenty days.
[6] For sixteen days.
[7] For twenty-six days.
[8] Incomplete.
[9] For twenty-four days.
[10] No record.
[11] For seventeen days.
[12] For twenty-seven days.
[13] For eighteen days.

NOTE.—Observations began April 10, 1886.

Table showing the mean of the maximum and minimum temperatures (in degrees Fahrenheit), at the cotton region stations, Signal Service, etc.—Continued.

Districts and stations.	April.		May.		June.		July.		August.		September.		October.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Memphis, Tenn.—continued.														
Dyersburgh, Tenn	[1]75.1	[1]55.5	84.1	59.1	86.9	63.6	93.5	67.5	91.6	68.6	86.5	61.8	75.2	46.0
Grand Junction, Tenn	75.3	56.2	81.3	59.5	84.7	66.0	89.8	67.8	88.5	68.7	84.5	63.9	74.6	50.6
Grenada, Miss	77.0	54.8	83.0	57.9	87.1	65.4	90.1	65.4	89.8	68.8	[2]85.0	[2]61.5	[2]74.5	[2]46.4
Hernando, Miss	74.7	52.3	81.8	55.9	83.9	65.2	89.4	66.1	88.4	67.1	85.4	60.8	73.3	47.2
Holly Springs, Miss	74.9	54.6	82.0	60.8	84.5	66.9	89.9	69.7	89.0	69.4	83.2	65.1	72.6	52.0
Memphis, Tenn	74.3	59.5	81.3	63.0	84.3	68.8	89.5	71.3	88.2	71.2	83.6	66.3	73.8	53.2
Milan, Tenn	79.0	56.0	83.3	59.2	86.9	65.6	93.5	66.9	91.7	68.5	86.1	85.1	74.7	46.8
Oxford, Miss	77.3	57.4	83.7	61.0	87.6	68.2	91.0	70.3	90.6	70.9	85.9	66.2	75.2	52.1
Paris, Tenn	76.8	42.8	81.5	45.7	84.7	52.9	92.3	55.6	90.2	56.8	82.0	49.2	72.1	31.9
Scottsborough, Ala	77.4	52.5	81.0	54.1	84.5	69.2	89.5	63.5	88.5	65.4	[2]84.9	[2]59.1	75.6	46.1
Tuscumbia, Ala	76.9	56.3	81.0	59.4	84.8	66.8	90.3	68.3	[3]89.3	[3]64.1	80.8	59.8	[3]75.7	[3]45.6
Mobile, Ala.:														
Aberdeen, Miss	76.0	59.9	82.6	60.5	81.2	67.6	87.5	68.7	86.7	69.4	82.2	65.1	73.9	50.5
Columbus, Miss	81.3	54.3	87.6	58.2	91.8	67.4	96.5	66.5	93.8	69.5	89.7	63.1	79.1	53.1
Evergreen, Ala	79.1	56.2	85.9	58.1	90.4	66.7	90.9	66.9	91.4	66.2	87.6	62.6	78.8	48.0
Livingston, Ala	(4)	(4)	85.1	56.9	87.4	68.1	91.2	69.4	90.5	70.5	87.5	66.2	79.4	50.2
Macon, Miss	78.8	55.8	86.8	59.9	88.2	73.4	94.5	68.0	93.1	70.9	89.9	64.3	79.3	48.8
Meridian, Miss	78.0	54.3	86.5	51.3	89.5	69.3	92.8	69.5	92.2	70.0	88.4	67.5	78.3	50.9
Mobile, Ala	74.9	60.3	80.6	63.8	85.8	71.8	87.2	72.7	89.0	73.3	86.3	71.4	76.6	58.4
Okolona, Miss	80.5	57.7	[5]86.6	[5]60.7	85.7	68.1	[2]93.8	[2]70.4	92.4	72.1	88.2	64.4	77.7	50.3
Waynesborough, Miss	77.5	54.2	84.6	60.0	88.3	69.3	90.7	70.5	92.0	70.5	87.4	66.5	78.9	51.0
Montgomery, Ala.:														
Birmingham, Ala	78.0	58.1	83.7	59.3	88.4	67.7	91.7	68.5	[5]91.1	[5]69.8	90.2	59.8	(4)	(4)
Calera, Ala	80.6	51.6	86.9	55.0	[6]93.1	[6]62.9	[3]95.0	[3]65.2	[2][illegible]4.3	[2]65.3	(7)	(7)	(7)	(7)
Eufaula, Ala	77.8	58.4	83.8	60.7	85.5	68.7	84.8	70.0	86.5	71.1	85.0	67.0	77.2	52.4
Fort Deposit, Ala	[8]78.1	[8]48.2	[5]83.9	[5]61.4	86.8	69.0	89.1	70.5	89.6	70.9	87.7	67.1	78.8	52.8
Greenville, Ala	76.8	58.9	85.2	64.6	88.0	61.8	89.8	67.1	90.8	70.4	88.7	68.3	80.6	54.5
Marion, Ala	78.8	58.0	83.4	58.8	87.1	69.9	89.5	70.6	90.1	71.2	87.8	68.0	79.3	55.7
Montgomery, Ala	78.1	58.7	84.4	63.3	87.7	71.0	90.0	72.1	89.8	72.9	87.2	69.8	[5]77.6	[5]56.4
Opelika, Ala	76.8	55.8	84.3	59.1	88.6	67.3	89.9	68.9	89.8	68.3	86.6	63.9	75.6	52.0
Pine Apple, Ala	79.4	50.5	[5]86.6	[5]54.7	90.4	64.3	92.4	65.7	91.8	65.3	88.3	60.3	80.0	40.1
Selma, Ala	(4)	(4)	82.3	56.3	[6]83.7	[6]54.3	88.8	72.0	[3]88.7	[3]72.1	86.8	69.1	77.8	60.7
New Orleans, La.:														
Alexandria, La	78.3	58.7	85.0	62.8	87.7	70.6	91.5	71.3	93.0	71.3	86.7	69.2	76.6	54.1
Amite City, La	77.1	56.1	85.0	59.7	85.9	70.2	89.2	70.4	89.5	70.2	84.1	67.9	76.7	52.8
Brookhaven, Miss	76.8	54.2	84.6	60.0	89.4	68.6	91.5	69.4	92.3	70.1	87.9	63.5	77.8	51.5
Cheneyville, La	81.4	58.3	82.9	61.8	91.7	69.9	93.7	70.3	93.7	70.3	89.2	67.3	(4)	(4)
Coushatta Chute, La	81.7	56.3	91.5	60.8	92.8	68.9	95.6	69.7	93.9	68.4	87.1	65.4	76.4	49.7
Hazlehurst, Miss	78.0	56.2	85.4	61.6	89.0	69.6	91.5	70.4	91.9	71.0	87.7	67.8	77.2	53.4
Lafayette, La	79.3	61.4	84.6	64.5	88.9	72.4	90.5	72.7	91.8	73.4	88.1	71.0	78.8	57.9

Minden, La	78.8	57.7	88.8	62.2	93.4	69.2	93.5	71.3	95.2	71.3	87.8	68.1	76.1	54.0
Natchez, Miss	79.2	57.7	85.0	62.9	88.2	70.8	91.0	76.7	92.0	72.3	[3]87.3	[3]68.5	77.4	56.2
Natchitoches, La	77.0	59.0	85.7	63.4	86.1	71.1	89.3	72.4	89.6	72.4	83.1	68.3	76.4	54.1
New Orleans, La	77.1	61.8	82.1	65.8	87.3	73.3	88.0	74.5	89.8	75.5	85.4	76.1	77.9	63.5
Opelousas, La	81.8	59.5	87.8	61.4	89.3	68.7	92.0	68.9	91.7	69.8	84.1	69.4	77.8	56.2
Port Gibson, Miss	81.3	56.1	87.6	60.7	89.6	70.0	91.3	70.9	[5]95.3	[5]70.9	91.1	66.8	[9]79.4	[10]52.9
Savannah, Ga.:														
Albany, Ga	80.0	58.8	86.4	62.3	89.9	71.1	[5]90.5	[5]73.3	88.4	72.5	89.6	69.3	79.5	55.0
Allapaha, Ga	78.4	58.6	85.9	60.5	89.6	69.8	90.0	71.1	90.4	70.9	86.7	68.6	76.8	58.9
Bainbridge, Ga	79.9	59.0	[11]86.0	[11]60.9	89.0	71.3	88.1	71.8	89.9	73.5	88.2	70.7	78.5	54.5
Eastman, Ga	80.5	58.0	87.2	62.1	91.0	69.7	90.3	71.6	92.3	71.8	[3]87.9	[3]68.9	[6]79.2	[6]56.2
Fernandina, Fla	73.5	61.1	[3]83.8	[3]56.3	87.0	73.1	87.2	72.6	[5]85.7	[5]72.5	(4)	(4)	76.9	65.0
Fort Gaines, Ga	(4)	(4)	86.4	60.6	89.9	70.1	90.8	71.9	90.5	71.1	89.2	66.8	79.2	51.2
Jesup, Ga	80.6	56.7	88.7	60.6	92.1	69.8	92.2	71.1	91.4	70.7	88.2	68.7	78.6	55.4
Live Oak, Fla	80.3	60.2	89.1	63.7	82.2	72.4	91.5	73.6	91.4	73.5	88.3	70.8	80.2	58.4
Millen, Ga	80.2	54.7	87.9	58.7	90.3	68.7	91.7	70.0	92.4	69.8	89.2	67.1	78.9	50.0
Quitman, Ga	81.3	59.8	88.7	67.0	91.2	74.8	89.8	76.7	92.0	74.8	88.5	61.2	79.8	65.6
Savannah, Ga	75.0	60.7	82.9	67.3	86.2	73.5	88.1	74.8	86.8	74.4	83.9	71.1	77.5	58.8
Smithville, Ga	84.1	56.1	90.2	60.1	94.4	69.0	94.8	71.2	94.4	70.8	91.1	67.7	79.5	52.3
Thomasville, Ga	82.8	59.0	89.8	60.5	92.1	68.8	93.1	70.3	94.7	70.6	91.4	69.8	84.5	56.1
Waldo, Fla	80.5	59.4	89.2	63.0	92.9	71.0	92.6	72.4	[2]93.0	[2]72.2	[11]86.0	[11]69.1	74.3	52.3
Way Cross, Ga	79.0	58.3	86.4	62.4	91.5	71.7	91.9	73.3	90.9	72.9	87.0	70.5	77.8	57.5
Vicksburg, Miss.:														
Edwards, Miss	77.9	57.4	84.7	62.6	87.9	70.7	91.6	72.0	92.6	72.5	89.0	68.9	77.9	53.9
Jackson, Miss	79.2	57.4	84.8	61.4	88.8	69.5	91.3	71.1	92.8	71.4	87.9	67.0	78.1	51.2
Lake, Miss	76.9	(4)	84.5	59.6	88.0	74.6	[2]90.7	75.2	[2]91.2	[12]71.7	[6]88.3	[6]73.7	75.0	56.0
Monroe, La	79.6	57.2	87.0	62.5	87.3	70.0	92.5	71.6	94.8	70.4	84.4	67.0	77.4	52.5
Vicksburg, Miss	77.9	59.1	82.7	64.1	85.9	70.0	89.9	72.2	90.7	72.1	87.1	69.2	75.7	57.5
Wilmington, N. C.:														
Cheraw, S. C	78.7	53.9	83.9	58.9	86.9	66.0	91.3	68.2	88.0	67.8	83.7	63.9	75.5	45.7
Florence, S. C	78.8	55.4	81.3	61.2	86.8	68.0	91.0	71.1	89.1	70.4	84.6	66.8	74.9	50.8
Goldsborough, N. C	76.8	54.1	82.3	60.4	84.7	68.9	82.2	72.1	85.4	71.5	83.7	68.9	74.4	56.2
Lumberton, N. C	77.8	54.0	[8]82.0	[8]58.6	84.0	67.3	89.5	69.5	87.0	69.0	83.6	65.3	74.3	49.1
New Berne, N. C	75.3	55.4	81.3	62.0	85.7	68.9	88.6	71.8	86.0	70.4	83.7	67.1	73.9	58.5
Raleigh, N. C	77.5	51.8	82.2	58.4	84.7	65.9	89.1	68.6	86.0	68.5	83.2	64.2	72.9	47.5
Salisbury, N. C	80.5	49.5	83.4	56.3	87.4	64.4	93.1	66.2	89.5	66.5	87.2	61.6	76.9	44.1
Wadesborough, N. C	77.4	52.7	82.6	58.2	85.7	64.2	91.0	67.8	88.8	67.3	84.7	63.4	71.2	46.6
Weldon, N. C	83.0	50.8	81.2	55.4	[3]86.4	[3]64.8	92.8	68.1	91.1	67.6	87.1	62.6	77.0	46.4
Wilmington, N. C	75.3	55.8	79.9	61.2	83.6	68.1	87.4	71.3	85.5	70.8	84.8	66.9	76.5	53.5

[1] For eighteen days.
[2] For twenty-nine days.
[3] For twenty-eight days.
[4] Incomplete.
[5] For thirty days.
[6] For twenty-six days.
[7] No record.
[8] For sixteen days.
[9] For nineteen days.
[10] For twenty-seven days.
[11] For twenty-four days.
[12] For twenty-three days.

NOTE.—Observations began April 10, 1886.

APPENDIX No. 25.

Mean a. m., p. m., and midnight temperatures (in degrees Fahrenheit) at stations of the commencement of observations

[Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m., Washington from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m., Washington time, and

Stations.	January.			February.			March.			April.			May.		
	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.
Abilene, Tex	28.2	42.6	33.9	38.5	58.1	47.3	45.5	61.9	52.9	52.6	71.2	60.6	66.5	88.5	76.6
Albany, N. Y	19.9	26.3	22.3	21.3	28.9	24.0	28.9	36.2	31.0	42.3	51.3	43.2	55.8	65.7	55.8
Alpena, Mich	14.7	21.4	16.7	13.7	22.8	17.1	19.2	28.7	22.8	33.5	40.9	34.3	46.7	53.1	46.5
Apache, Fort, Ariz	23.6	45.4	32.2	27.5	51.5	37.9	32.8	57.9	43.5	36.0	65.2	49.6	41.4	74.9	57.5
Assinniboine, Fort, Mont.	6.4	12.0	8.7	12.8	20.8	17.1	24.7	36.2	30.4	34.2	51.2	43.1	44.2	62.1	54.0
Atlanta, Ga	38.0	47.2	42.4	41.3	52.6	46.7	46.2	59.0	52.0	54.6	67.5	60.2	62.9	75.5	67.7
Atlantic City, N. J	29.2	35.0	31.0	30.5	36.6	32.2	35.4	41.8	36.6	44.9	50.1	44.5	55.9	60.5	54.6
Augusta, Ga	41.0	53.9	45.5	43.5	58.6	48.6	48.5	64.9	54.1	57.3	72.6	61.2	66.9	81.1	69.1
Baltimore, Md	31.0	37.5	33.6	32.7	41.2	35.8	37.9	46.6	41.1	48.7	59.1	51.5	60.2	70.9	61.9
Behring's Island, Behring Sea.[1]	26.0	26.3	27.0	27.1	26.7	28.7	26.4	26.1	28.6	28.0	29.0	31.4	34.1	35.2	37.7
Benton, Fort, Mont[2]	9.3	19.4	12.9	15.8	28.7	21.6	25.7	43.6	33.2	33.3	53.3	42.5	43.9	65.4	53.8
Bidwell, Fort, Cal	25.4	34.6	30.3	33.4	46.5	40.6	29.0	40.6	36.4	35.2	47.6	42.7	44.3	61.5	54.9
Bismarck, Dak	—0.6	10.5	3.7	5.5	17.5	10.2	16.3	28.9	21.4	33.4	48.8	39.5	47.9	63.9	53.7
Block Island, R. I	28.6	32.4	30.2	29.0	33.4	30.5	32.2	37.6	33.9	41.4	47.1	42.0	50.6	55.1	50.1
Boisé City, Idaho	22.4	33.3	29.6	29.0	39.4	35.4	35.1	50.0	44.6	40.6	57.4	51.7	47.0	66.3	58.9
Boston, Mass	23.2	30.2	25.3	24.3	32.3	26.6	30.9	38.1	32.4	42.0	48.8	41.9	54.8	60.6	52.7
Bridger, Fort, Wyo	16.1	26.9	19.9	24.6	35.6	27.6	19.0	31.5	23.4	30.4	43.9	34.4	38.2	62.0	47.2
Brownsville, Tex	52.1	64.4	55.8	57.0	68.8	59.8	63.7	74.9	66.6	69.5	80.7	72.0	74.6	84.8	76.3
Buffalo, N. Y	22.8	25.9	23.7	22.0	27.2	24.4	27.9	33.0	29.5	39.0	45.1	40.3	51.3	57.3	52.2
Buford, Fort, Dak	—0.4	10.8	3.5	3.8	16.5	8.8	17.2	30.8	22.6	32.7	51.1	40.2	45.3	64.2	54.3
Cairo, Ill	30.5	38.5	34.2	35.2	44.6	39.6	42.0	52.2	46.8	53.0	64.3	57.8	62.9	74.4	66.3
Canby, Fort, Wash	40.0	42.4	41.9	41.5	44.9	44.0	43.3	46.5	46.6	46.3	50.2	49.8	49.7	53.4	53.6
Cape Henry, Va[3]	38.1	42.4	39.7	39.8	45.1	41.2	43.9	49.4	45.3	52.1	57.5	52.2	62.2	67.8	61.8
Cape Mendocino, Cal[3]	45.2	49.8	48.1	44.5	49.8	47.4	45.5	51.1	48.4	45.8	51.6	48.2	48.4	54.5	50.7
Cedar Keys, Fla	53.0	60.9	57.0	56.1	64.7	59.4	58.9	67.2	62.6	66.0	74.7	68.4	72.3	80.6	73.8
Charleston, S. C	45.2	53.3	48.6	48.2	57.3	51.7	52.9	62.6	56.4	60.6	69.4	62.8	69.8	77.2	71.0
Charlotte, N. C	36.0	45.7	40.0	39.2	51.7	44.4	44.1	57.2	48.8	53.1	66.6	57.3	63.6	76.1	66.4
Chattanooga, Tenn	36.5	45.1	40.6	39.2	50.5	44.2	44.7	57.2	50.3	53.7	67.3	58.5	62.0	76.3	65.8
Cheyenne, Wyo	19.9	32.1	22.2	22.1	36.5	25.5	25.9	42.4	30.8	31.2	49.3	37.9	42.0	61.4	49.1
Chicago, Ill	21.0	27.5	23.7	24.3	31.7	28.1	31.1	37.8	34.6	42.6	49.0	45.2	54.1	60.1	55.5
Chincoteague, Va	31.9	36.3	33.4	34.6	40.3	36.1	37.9	44.4	39.9	47.6	53.4	47.7	58.5	63.6	58.0
Cincinnati, Ohio	29.6	36.8	32.4	32.2	41.5	36.4	38.1	48.2	42.4	48.9	60.8	53.7	59.6	72.4	64.0
Cleveland, Ohio	23.6	28.4	25.3	24.5	30.6	27.5	30.4	36.6	33.3	42.4	48.8	44.4	54.8	62.0	56.9
Columbus, Ohio	24.3	30.8	27.3	28.0	35.8	31.9	33.7	42.9	37.8	44.8	57.0	49.9	56.8	70.2	61.4
Concordia, Kans	6.0	14.7	10.7	24.8	37.3	30.1	28.8	40.8	35.3	33.4	59.8	49.7	53.4	71.6	61.8
Custer, Fort, Mont	9.3	20.3	13.6	16.6	28.6	22.0	25.3	57.6	32.7	34.5	54.4	45.1	44.6	65.4	55.6
Davenport, Iowa	16.8	25.1	20.7	21.4	31.9	26.7	30.0	40.3	35.0	43.4	55.8	48.6	55.7	66.2	60.2
Davis, Fort, Tex	33.7	53.9	41.3	37.8	59.9	46.9	43.1	65.9	53.2	49.9	72.1	59.8	58.7	79.9	67.1
Deadwood, Dak	16.7	27.4	19.1	19.9	30.7	23.1	25.8	38.6	30.4	33.5	46.5	38.8	43.7	36.5	48.6
Denver, Colo	15.1	35.4	25.7	25.0	41.1	31.0	30.4	48.6	38.7	36.7	55.1	45.9	46.8	66.3	56.4
Des Moines, Iowa	13.2	22.8	17.9	18.8	29.7	24.1	29.1	41.2	34.6	42.6	57.0	49.3	54.0	69.4	60.6
Detroit, Mich	22.1	27.4	23.8	23.2	30.7	26.2	29.0	37.3	32.0	41.0	51.4	42.9	53.4	64.6	55.6
Dodge City, Kans	18.2	33.0	24.0	24.6	42.5	31.4	31.8	52.6	40.4	43.0	64.0	51.2	54.8	73.1	61.2
Dubuque, Iowa	12.9	23.2	18.3	17.8	29.9	24.0	27.2	38.2	32.7	41.7	55.3	47.2	54.5	68.5	59.2
Duluth, Minn	5.5	15.3	10.1	10.3	21.4	16.1	17.9	30.1	24.0	33.8	42.8	37.3	45.2	54.0	47.5
Eastport, Me	17.4	22.6	19.5	19.5	25.5	21.6	25.5	31.2	27.5	36.3	41.9	36.2	46.3	51.5	44.1
Elliott, Fort, Tex	22.7	39.7	28.1	27.3	45.9	33.8	36.3	56.4	43.8	44.7	66.7	54.6	54.4	73.3	62.9
El Paso, Tex	35.9	53.1	44.2	40.5	60.3	49.8	45.4	67.2	56.1	51.2	75.0	62.9	59.9	85.1	72.5
Erie, Pa	24.9	29.1	26.8	25.0	30.5	27.7	30.1	35.7	32.8	41.8	47.3	42.8	55.1	61.3	55.6
Escanaba, Mich	10.2	18.2	13.4	10.5	21.4	14.9	16.2	28.7	21.1	31.8	41.3	34.3	46.0	54.7	47.3
Fort Smith, Ark	25.6	36.5	30.4	32.4	45.6	39.0	41.5	57.0	49.0	52.3	68.3	59.6	60.7	78.1	66.9
Frisco, Utah	23.6	34.0	28.6	33,2	45.3	37.3	25.5	37.0	31.1	35.1	48.4	41.3	52.6	67.6	57.7
Galveston, Tex	49.4	54.9	52.3	53.9	60.0	56.5	59.6	66.6	62.8	66.3	73.0	68.6	73.3	80.4	75.1
Grand Haven, Mich	22.9	26.6	24.1	22.0	28.8	25.0	27.2	34.4	30.4	40.7	47.8	42.6	53.1	58.8	53.3
Grant, Fort, Ariz	34.6	49.6	42.4	38.8	54.1	45.8	43.0	47.4	51.2	47.6	67.1	57.4	56.6	77.0	66.4
Greencastle, Ind[4]	18.2	25.0	21.1	20.3	29.2	24.0	31.3	41.2	35.6	47.6	59.0	51.8	55.6	69.0	60.8
Hatteras, N. C	42.4	45.0	42.9	44.6	49.0	45.4	46.4	52.0	48.0	51.6	59.9	54.7	64.8	69.7	63.8

[1] Station closed May 7, 1886.

[2] Station closed December 8, 1886.

APPENDIX No. 25.

Signal Service, United States Army, for each month of the year (computed from the to December, 1886, *inclusive).*

time; from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m., Washington time, from January 1, 1885, to December 31, 1886, at 7 a. m., 3 and 11 p. m., 75th meridian time.]

June.			July.			August.			September.			October.			November.			December.		
A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.
70.8	87.6	78.4	75.4	92.9	83.8	74.3	90.4	81.6	68.2	80.8	73.9	55.4	73.4	62.4	46.1	63.4	52.6	39.6	55.2	45.4
65.7	74.5	64.7	69.5	78.6	69.1	66.8	77.5	67.4	59.1	69.9	60.5	47.3	57.0	49.4	36.4	44.3	38.2	26.0	30.7	28.2
57.6	63.8	56.7	62.8	70.1	62.8	60.7	69.5	61.7	53.4	62.2	54.8	42.1	50.0	44.0	30.5	35.2	31.4	21.5	25.9	22.7
49.2	84.8	66.8	60.3	85.6	73.4	59.3	81.8	68.9	49.8	78.6	61.8	39.9	69.5	51.4	28.7	56.8	39.0	26.0	50.2	34.7
54.7	72.6	64.6	57.3	76.8	68.2	55.6	75.5	66.0	-45.4	62.6	53.4	35.7	49.2	41.4	25.2	36.2	29.6	16.9	23.1	18.6
70.7	81.0	73.6	73.3	84.7	76.9	70.5	82.1	74.3	65.5	78.3	70.6	56.9	70.1	62.1	45.7	57.8	50.0	39.6	50.0	44.0
65.8	70.4	63.9	71.2	76.2	69.6	70.4	75.5	70.1	65.1	71.0	65.4	54.6	61.1	55.5	42.0	48.5	43.4	33.3	38.6	34.9
74.1	86.0	75.5	77.3	89.1	78.7	74.8	86.7	76.9	69.5	82.7	72.2	57.4	73.8	61.3	46.8	62.5	51.5	41.2	56.1	45.6
70.2	79.9	70.7	74.7	84.5	75.2	71.2	81.3	72.9	63.8	74.5	66.1	53.3	64.0	56.0	42.2	49.8	44.2	33.5	40.4	36.2
40.0	41.6	44.8	45.1	46.5	49.7	49.4	50.2	53.2	45.1	46.0	49.3	36.6	36.5	38.5	31.9	30.0	30.9	27.1	27.0	27.8
53.3	73.7	63.4	58.9	80.6	69.1	56.4	79.6	68.5	45.3	66.2	55.3	34.4	52.2	42.0	25.0	40.3	30.8	17.0	28.8	21.8
51.2	71.2	62.1	53.8	81.8	70.4	58.1	79.2	71.6	44.4	71.2	59.8	38.0	59.2	48.5	31.2	40.9	36.2	33.4	40.5	36.8
57.1	72.4	61.8	62.0	79.0	68.0	58.5	77.9	66.1	46.7	66.7	54.1	35.7	53.4	41.6	20.3	32.1	24.1	9.2	18.7	12.2
61.0	65.8	59.8	67.2	72.8	66.7	66.4	71.8	66.6	62.6	67.3	62.8	53.2	58.0	54.0	43.6	47.5	45.2	34.5	37.4	35.9
53.9	75.7	68.6	58.9	83.7	75.8	58.2	83.3	75.2	48.2	67.5	61.4	39.2	56.6	49.2	31.9	44.4	38.5	27.8	37.4	32.8
61.5	71.4	62.0	69.8	76.4	67.8	67.1	74.4	66.1	59.7	67.5	59.5	49.1	56.9	49.8	37.1	43.6	38.1	27.3	33.4	29.2
42.0	66.9	54.8	49.9	77.5	63.6	50.1	72.7	59.0	40.9	64.9	48.7	32.5	54.0	39.0	21.7	36.0	26.8	24.2	33.4	25.5
78.5	88.7	80.5	79.8	89.7	81.7	78.2	89.3	80.7	74.8	85.6	77.8	70.3	81.5	73.3	60.8	71.9	64.2	56.0	67.1	59.0
62.2	68.2	62.8	67.0	73.4	68.2	65.7	73.8	67.1	59.0	66.9	60.3	48.2	54.7	49.6	35.9	39.9	36.9	27.4	30.3	28.6
55.6	73.8	62.6	58.8	78.8	66.5	55.5	78.3	65.1	43.5	66.4	52.2	34.7	52.2	40.8	20.8	32.7	24.3	5.9	15.7	8.2
70.9	81.2	73.2	75.1	85.6	77.6	72.7	84.5	75.7	63.6	77.3	68.0	53.3	67.7	57.8	41.1	51.7	45.5	33.7	42.2	37.4
52.8	56.4	56.6	56.9	62.0	59.1	57.2	61.8	59.0	56.3	60.3	57.6	50.8	55.0	52.5	46.6	49.8	48.6	42.3	45.0	43.8
71.5	77.3	70.2	76.1	82.2	74.8	74.5	79.8	73.9	70.1	76.0	69.8	60.8	66.6	61.3	49.5	55.3	50.7	40.7	46.1	42.6
41.3	57.2	54.1	52.1	57.5	55.2	52.2	57.5	55.3	54.5	60.2	57.1	51.4	56.8	54.0	49.4	53.9	51.5	48.0	51.6	50.4
78.5	84.9	78.8	80.5	85.6	80.7	79.0	86.0	79.9	75.9	84.7	78.2	69.0	78.3	71.5	58.8	68.5	62.1	54.4	62.6	57.5
77.0	83.9	77.2	80.2	87.0	80.4	77.8	84.7	79.2	72.8	80.5	75.1	63.2	71.9	66.0	53.3	62.5	56.4	46.8	55.7	50.2
71.5	81.7	72.9	74.4	85.6	76.4	71.5	82.4	74.5	65.0	77.5	68.5	54.8	69.3	59.6	43.7	57.0	48.4	37.3	48.7	41.6
69.8	82.0	72.2	72.4	85.4	75.2	70.2	82.9	73.5	64.0	78.8	68.4	55.8	70.6	60.4	43.4	56.3	48.0	37.9	48.1	41.5
51.3	73.0	59.0	56.4	79.3	65.5	54.2	77.3	63.3	44.6	68.8	53.1	36.1	56.0	41.4	28.1	42.0	30.1	23.2	35.1	25.0
63.2	69.2	64.0	69.4	76.0	71.0	68.0	75.5	70.7	60.0	69.3	63.7	48.8	57.6	52.4	35.5	42.3	38.6	26.5	32.2	20.0
68.2	73.2	66.8	73.3	78.5	72.3	72.6	75.8	71.9	68.3	73.5	68.6	58.8	64.2	59.7	45.6	52.0	47.4	36.3	42.1	38.0
68.8	80.1	72.0	72.8	84.6	96.3	69.9	82.3	74.2	62.2	75.2	66.8	51.8	64.2	56.3	40.2	49.0	43.4	32.8	40.1	35.7
64.4	72.0	65.6	68.7	76.3	67.9	66.4	75.1	68.4	59.5	69.2	62.2	49.1	58.1	52.1	36.6	42.2	38.2	27.9	32.1	20.2
65.4	76.8	68.7	69.8	82.3	73.6	66.2	79.7	70.6	59.6	74.0	64.1	49.9	62.9	54.3	36.8	46.1	40.5	28.9	34.9	31.1
62.3	79.1	69.0	68.0	84.4	74.4	64.8	83.3	72.4	59.2	76.3	65.8	45.8	66.2	53.8	32.6	48.4	37.6	23.2	35.2	27.9
54.8	73.7	64.2	59.4	81.6	71.7	53.0	80.8	70.4	45.8	68.8	57.7	36.7	56.6	45.4	24.5	41.9	30.8	15.9	27.2	19.1
65.4	76.6	68.9	69.5	82.0	73.9	67.1	80.0	71.9	58.3	71.7	63.0	47.2	59.3	51.8	32.8	42.2	36.5	23.2	30.5	26.3
66.0	85.4	72.9	67.4	84.6	73.6	64.3	81.3	70.8	58.5	77.3	66.1	52.1	71.9	59.5	40.9	61.6	49.0	36.3	57.0	43.6
53.8	67.3	58.4	58.1	73.3	63.7	56.2	72.6	61.8	46.7	63.3	52.1	39.7	52.0	42.9	28.3	38.9	31.0	19.5	28.5	21.3
55.8	77.4	65.3	61.6	83.2	71.7	59.9	80.9	69.9	49.8	72.7	60.7	40.4	61.5	49.4	29.8	47.7	35.0	24.8	39.6	28.5
63.4	77.4	63.4	67.4	82.8	73.0	65.9	81.4	71.7	57.2	72.1	62.6	47.0	60.9	51.8	32.2	43.3	36.3	20.0	28.1	22.9
63.2	73.8	65.0	67.0	78.5	69.4	65.2	76.7	68.2	58.1	69.3	61.2	47.8	57.5	50.9	35.4	41.2	37.2	26.7	31.3	28.4
61.7	82.7	70.6	69.1	87.6	75.1	66.9	85.3	73.2	58.0	78.6	65.0	45.8	66.7	53.1	30.5	50.2	36.9	23.4	40.5	28.9
62.9	75.5	66.8	68.3	82.2	72.2	65.3	80.1	69.9	56.7	70.4	61.0	45.8	58.4	50.2	30.6	40.7	34.6	20.6	29.0	24.4
55.0	63.1	56.5	62.5	72.4	61.3	61.6	71.2	63.4	51.7	61.2	54.4	41.1	49.6	44.3	25.4	32.6	28.0	11.8	20.2	15.0
54.7	60.0	51.3	59.6	65.4	56.5	59.4	65.4	57.1	54.2	59.4	53.1	45.6	50.0	45.5	34.6	38.1	35.0	23.5	27.4	24.7
63.9	82.4	72.4	67.1	86.4	76.2	65.5	84.4	73.7	58.6	79.1	66.1	48.5	67.6	55.0	33.8	53.7	38.9	27.2	44.8	31.7
69.2	92.3	79.7	72.6	92.7	81.0	70.1	89.2	77.9	62.4	83.4	71.5	53.0	75.3	61.8	41.3	61.4	49.4	37.5	56.3	45.6
65.0	71.6	64.6	69.7	75.7	69.5	67.4	74.8	67.8	61.0	68.3	62.3	50.5	57.2	52.2	38.5	42.9	39.8	30.4	33.8	31.9
57.4	65.9	58.2	62.9	72.5	64.0	60.6	70.4	62.8	52.4	61.7	54.9	41.8	49.3	44.3	28.5	34.6	30.5	17.9	23.6	19.8
69.5	84.1	74.2	72.9	88.4	77.7	69.7	86.8	75.3	64.3	82.8	70.5	54.9	72.2	60.1	43.2	59.4	48.8	33.7	46.9	38.5
60.1	73.6	67.1	67.0	79.8	73.8	64.4	77.0	69.7	57.2	69.8	62.8	45.4	57.1	49.6	31.4	41.1	35.0	33 0	42.1	35.8
79.9	86.6	80.9	61.6	88.7	83.0	80.7	87.7	82.5	76.9	82.9	79.2	69.5	75.9	73.1	59.3	65.0	61.7	54.0	59.0	56.4
62.8	67.9	61.6	67.4	72.9	66.7	65.1	72.2	65.8	57.9	65.5	59.4	47.3	54.5	49.5	35.2	39.6	37.0	27.4	30.3	28.6
65.8	85.3	75.6	69.7	85.8	78.0	67.5	82.7	74.2	62.9	79.6	70.5	53.8	71.0	61.3	42.5	58.9	49.5	38.1	54.2	45.5
63.0	74.7	67.0	68.0	81.5	73.5	65.4	78.2	69.5	59.2	71.6	63.6	49.2	62.0	53.9	37.2	46.8	40.5	27.8	33.6	29.2
73.0	77.4	71.4	77.0	81.6	75.8	76.1	80.1	75.3	73.4	77.7	72.8	65.2	69.6	65.1	53.9	58.6	55.2	45.3	49.3	46.5

[3] Station closed December 31, 1886.

[4] Station closed November 10, 1886.

Mean a. m., p. m., and midnight temperatures (in degrees Fahrenheit) at stations of the

Stations.	January.			February.			March.			April.			May.		
	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.
Helena, Mont	11.9	17.9	15.7	19.8	27.3	23.7	28.7	38.8	34.3	36.0	48.5	42.2	44.1	52.0	52.8
Huron, Dak	1.9	12.8	5.7	7.9	20.7	12.8	22.3	34.2	27.4	36.2	53.5	44.0	46.5	63.6	53.7
Indianapolis, Ind	24.7	32.4	28.1	27.8	37.3	32.6	34.9	45.4	39.3	47.2	59.1	51.4	58.9	71.0	61.8
Indianola, Tex[1]	48.4	56.0	51.4	54.1	61.6	55.9	61.2	68.7	63.6	66.3	74.5	68.5	73.4	80.3	74.6
Jacksonville, Fla	50.2	61.9	53.6	52.5	64.8	56.2	57.2	69.5	60.4	65.1	75.6	65.6	73.3	80.9	71.8
Keeler, Cal	38.4	46.3	43.6	44.0	55.6	52.8	42.8	57.2	52.7	48.2	63.6	58.3	58.2	76.0	70.6
Keokuk, Iowa	19.1	28.1	23.2	24.2	34.7	29.1	32.3	43.6	37.1	45.5	58.1	50.4	57.9	70.1	61.9
Key West, Fla	67.5	73.1	69.0	69.0	74.8	70.2	71.0	77.1	71.9	75.0	80.4	74.8	78.6	83.4	77.8
Kitty Hawk, N. C.[2]	39.9	44.0	41.2	41.2	46.0	42.8	44.8	51.3	46.3	52.0	57.9	52.5	62.0	68.3	61.5
Knoxville, Tenn	32.5	42.5	36.2	35.9	48.0	40.9	40.8	54.8	46.9	50.6	65.6	55.9	59.9	75.4	64.0
La Crosse, Wis	11.0	19.8	15.3	15.8	27.1	22.1	25.5	36.4	31.9	41.0	53.0	47.0	54.4	67.0	60.0
Lamar, Mo	15.0	24.1	18.9	28.0	39.4	33.0	35.3	48.2	41.6	48.6	62.7	54.0	58.4	74.2	65.0
Las Animas, Colo	10.2	31.2	17.2	18.1	41.7	27.7	27.9	53.6	39.9	37.5	61.7	48.8	48.0	71.2	57.5
Leavenworth, Kans	20.0	29.9	24.6	25.2	38.2	31.6	33.8	48.1	40.2	46.2	61.1	52.7	58.2	72.4	63.9
Little Rock, Ark	35.3	44.4	39.8	40.9	51.1	46.3	46.9	58.7	53.0	56.0	69.5	62.4	63.9	77.3	69.2
Los Angeles, Cal	46.2	60.8	51.4	47.6	63.1	53.3	48.8	64.5	54.5	51.2	67.1	56.3	53.9	72.4	59.8
Louisville, Ky	30.8	37.8	33.9	33.8	42.9	38.0	39.1	48.3	43.9	50.3	61.9	55.0	61.5	73.9	65.4
Lynchburgh, Va	32.3	42.0	35.1	34.7	46.7	38.4	39.1	52.7	43.9	50.2	63.6	53.8	61.9	74.0	63.0
Mackinaw City, Mich	11.6	17.3	13.9	9.2	17.8	13.0	14.0	25.9	19.2	33.2	41.2	35.3	44.0	51.8	44.3
Macon, Fort, N. C.[2]	41.0	47.0	42.5	43.9	51.7	46.2	46.5	54.0	49.4	55.1	62.5	56.3	65.6	72.5	65.8
Maginnis, Fort, Mont	10.7	19.8	15.9	15.3	25.6	19.6	25.6	37.8	28.9	33.2	47.8	37.3	42.8	59.4	46.6
Marquette, Mich	13.5	19.8	15.5	14.0	23.2	17.5	19.1	28.6	22.3	33.9	41.9	35.4	47.6	54.5	47.6
Memphis, Tenn	34.6	43.4	39.1	39.0	49.4	44.6	46.1	57.1	51.5	55.6	67.4	60.6	65.9	77.8	69.0
Milwaukee, Wis	16.4	22.9	19.1	19.5	27.1	23.6	26.6	33.9	30.4	39.0	45.3	41.7	51.0	56.8	52.2
Mobile, Ala	45.3	55.7	49.2	49.1	60.8	53.2	54.0	66.0	58.5	61.8	73.5	65.0	69.2	81.3	71.9
Montgomery, Ala	42.9	54.0	47.7	45.8	59.1	51.4	50.5	65.1	56.5	58.2	72.6	63.1	67.1	81.1	70.9
Montrose, Colo	16.2	31.4	22.6	23.4	39.6	30.4	26.4	46.8	35.4	36.8	53.6	43.4	45.6	68.6	56.0
Moorhead, Minn	-8.2	3.2	-3.7	-0.6	11.2	5.8	12.4	25.2	19.2	32.8	47.0	39.1	46.0	61.0	52.5
Mt. Washington, N. H	4.7	6.2	5.2	5.6	7.4	5.7	8.9	11.5	9.6	19.8	23.5	20.5	31.8	36.4	32.9
Nashville, Tenn	33.6	42.7	37.4	37.1	48.3	41.8	43.3	55.6	48.4	53.8	66.7	58.1	61.6	76.7	67.0
New Haven, Conn	24.0	31.4	26.6	25.4	33.2	28.0	31.7	39.4	33.1	43.3	51.0	43.2	55.8	63.2	54.3
New London, Conn	25.4	31.9	27.9	26.4	33.1	28.4	32.7	38.8	33.7	44.1	49.3	43.4	56.0	60.0	52.9
New Orleans, La	49.6	58.1	52.8	53.4	63.3	56.8	58.2	68.1	61.7	65.3	74.6	67.9	72.2	80.0	73.2
New York City	27.1	33.0	29.1	27.9	34.7	30.1	33.2	40.8	35.3	43.9	52.4	45.4	55.7	64.2	56.7
Norfolk, Va	38.4	43.7	39.2	39.0	47.6	41.4	43.6	52.9	46.2	53.0	62.1	53.7	64.0	72.6	64.3
North Platte, Nebr	12.1	28.6	17.7	18.4	36.0	24.7	26.8	44.8	34.1	38.0	57.4	45.8	51.0	67.4	57.5
Olympia, Wash	35.7	40.3	38.2	36.8	42.7	39.9	38.8	48.5	45.6	41.3	53.6	49.6	44.8	59.8	56.1
Omaha, Nebr	14.5	24.9	19.2	20.3	32.3	26.1	29.1	42.2	35.0	43.0	57.5	49.3	56.0	69.9	61.2
Oswego, N. Y	23.4	27.0	24.8	22.9	28.1	25.2	28.6	33.8	30.8	40.4	45.6	41.7	51.6	59.0	52.8
Palestine, Tex	35.8	46.8	41.4	43.2	55.3	49.3	51.7	64.9	58.6	58.7	72.3	64.7	64.6	78.5	69.8
Pensacola, Fla	48.5	57.0	51.8	51.3	61.7	55.8	55.5	65.7	59.5	63.5	72.6	66.2	69.9	79.3	72.0
Philadelphia, Pa	28.6	34.6	30.6	29.8	37.6	32.5	35.2	44.0	38.1	45.7	56.3	47.9	57.5	69.0	59.2
Pike's Peak, Colo	0.5	5.1	2.0	1.1	7.0	3.0	4.1	11.7	6.4	8.9	17.4	11.9	18.5	27.0	21.2
Pittsburgh, Pa	27.8	34.3	30.6	28.6	37.2	31.8	33.5	43.6	37.3	44.5	58.1	48.4	55.9	70.8	59.5
Poplar River, Mont	-10.9	2.6	-2.1	-2.7	10.5	7.3	19.9	35.0	26.7	33.0	53.2	40.9	44.2	67.5	53.9
Port Angeles, Wash	30.7	36.2	32.8	37.9	45.5	41.2	36.4	47.8	42.4	38.1	50.4	45.6	42.9	54.8	51.4
Port Huron, Mich	18.3	24.4	20.3	19.3	26.7	22.4	25.3	32.3	28.3	39.2	45.0	39.5	50.0	58.0	50.6
Portland, Me	19.8	27.2	22.4	21.5	30.2	25.0	28.7	36.7	30.7	40.8	48.6	41.4	52.4	59.7	51.9
Portland, Oregon	36.5	41.8	39.0	38.7	45.6	42.1	42.2	51.8	48.0	44.5	57.6	52.6	48.9	62.8	58.1
Prescott, Ariz	24.0	44.6	32.4	26.6	48.4	37.6	31.4	55.2	42.4	37.2	61.3	48.4	43.4	70.9	56.9
Red Bluff, Cal	40.8	49.7	46.6	43.7	54.4	50.8	47.3	61.1	56.1	50.9	65.7	60.2	56.6	74.8	68.3
Rio Grande City, Tex	49.0	63.6	55.6	54.7	71.2	61.1	62.4	79.4	68.0	68.1	88.0	73.5	72.9	91.5	77.8
Rochester, N. Y	22.1	25.6	23.0	21.9	27.4	23.8	27.5	33.6	29.1	40.1	47.5	41.4	53.2	62.2	54.1
Roseburgh, Oregon	37.6	43.2	40.9	38.8	46.0	43.5	40.5	52.5	49.3	43.0	57.1	52.4	46.3	63.4	58.2
Sacramento, Cal	41.7	49.5	47.0	45.1	54.0	51.6	48.8	59.6	55.8	51.1	63.4	58.7	55.0	70.5	64.7
Saint Louis, Mo	26.7	34.9	30.1	30.7	40.3	35.4	37.3	49.0	42.9	49.3	62.2	54.7	60.5	72.9	65.0
Saint Michaels, Fort, Alaska[3]	5.6	8.4	8.1	-4.6	-1.6	-0.8	5.0	9.9	11.7	14.9	21.1	23.7	28.9	34.9	36.3
Saint Paul, Minn	7.3	16.3	11.1	11.7	23.5	16.9	22.4	34.4	28.2	38.4	52.0	44.3	52.7	66.1	57.3
Saint Vincent, Minn	-12.3	-2.7	-9.0	-5.4	6.4	0.8	7.4	20.3	14.1	29.0	43.0	35.2	44.5	60.4	50.4
Salt Lake City, Utah	25.0	33.2	27.8	29.3	39.0	33.0	35.8	47.8	41.0	42.3	55.6	48.7	50.1	65.2	57.2
San Antonio, Tex	44.3	57.9	50.1	48.5	63.4	55.1	56.1	71.0	62.3	62.7	77.9	68.4	68.7	83.6	73.9
San Diego, Cal	48.3	60.7	52.8	49.5	61.0	53.9	51.1	61.6	55.1	52.9	63.8	57.2	56.8	66.3	60.2
Sandusky, Ohio	24.2	29.2	26.2	26.7	32.3	29.5	32.6	38.3	35.3	44.1	50.5	46.6	56.4	64.1	58.6
Sandy Hook, N. J.[4]	28.5	32.9	30.1	29.0	34.8	30.7	34.1	40.5	36.0	43.6	50.9	44.6	55.6	63.5	56.1
Sanford, Fla	52.3	66.9	58.8	55.1	69.9	62.3	59.0	71.9	62.2	65.1	77.8	66.0	71.5	82.4	70.6
San Francisco, Cal	47.9	52.9	51.0	49.0	55.3	52.2	50.1	57.6	53.1	50.9	59.1	53.6	52.4	61.7	55.4
Santa Fé, N. Mex	20.7	35.6	26.4	24.9	40.5	31.1	30.3	49.0	38.3	36.4	55.3	44.3	46.7	66.1	55.0
Savannah, Ga	46.2	57.2	50.4	48.7	60.2	53.3	54.1	65.5	57.9	62.4	72.3	64.1	71.1	79.0	71.1
Shaw, Fort, Mont.[5]	11.4	20.0	15.6	18.5	28.4	21.9	26.2	42.3	32.0	32.7	50.4	40.3	41.5	61.0	50.8
Shreveport, La	39.8	50.9	44.7	44.5	57.5	50.8	51.3	65.7	57.8	58.8	73.6	64.6	67.3	81.6	71.7
Sill, Fort, Ind. T	28.4	42.0	33.9	33.9	50.3	40.8	42.7	61.7	50.8	52.4	72.0	60.7	62.3	79.0	68.2
Sitka, Alaska	34.4	36.0	35.1	32.9	35.7	34.8	35.9	39.8	38.2	38.9	44.9	43.3	44.0	49.6	49.5
Smithville, N. C.[6]	42.8	50.4	45.6	44.8	53.6	48.2	49.3	58.0	52.4	57.4	65.4	58.9	66.6	74.7	69.4

[1] Station closed August 20, 1886.
[2] Station closed December 31, 1886.
[3] Station closed June 30, 1886.
[4] Station closed November 30, 1886.
[5] Station closed October 27, 1886.
[6] Station closed October 31, 1886.

Signal Service, United States Army, for each month of the year, etc.—Continued.

June.			July.			August.			September.			October.			November.			December.		
A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.
52.7	67.5	61.2	59.0	73.8	67.5	58.6	73.7	68.3	49.1	61.3	56.0	38.0	48.2	43.3	27.3	34.5	30.8	20.4	25.8	22.4
58.1	74.9	64.8	62.1	79.1	68.3	59.5	78.1	66.7	49.4	69.3	56.2	38.8	56.7	45.1	24.2	37.4	27.8	12.1	24.2	15.4
68.2	78.8	69.8	71.9	83.2	73.9	68.3	81.6	71.6	59.6	73.8	63.9	49.1	62.4	53.9	36.5	45.6	40.1	28.7	35.7	31.7
79.6	86.3	79.9	80.7	88.5	81.5	79.7	87.4	81.1	76.2	83.2	78.5	69.1	77.1	72.1	58.8	66.5	61.6	53.0	60.3	55.6
79.3	85.0	77.1	80.9	87.3	79.1	79.2	85.7	77.7	75.0	82.7	75.9	66.1	75.8	68.0	56.5	68.1	59.7	50.2	62.5	54.1
62.2	80.7	75.4	69.8	88.1	82.2	72.9	87.7	83.2	65.8	79.3	77.2	54.2	66.6	63.0	43.0	53.0	49.2	40.4	49.1	45.6
67.8	78.5	70.2	72.4	84.4	75.3	69.1	82.9	73.2	60.3	74.0	64.6	48.7	61.9	53.4	34.0	44.2	37.9	24.4	32.3	27.8
82.1	86.6	80.9	83.0	87.7	82.0	82.8	87.9	82.3	81.3	86.2	81.2	77.2	81.5	77.7	72.8	77.2	73.5	68.0	73.1	69.2
71.0	77.3	70.4	76.7	82.2	75.0	75.2	80.0	74.7	70.7	76.2	70.9	62.1	67.1	62.4	50.7	56.4	52.1	42.6	47.7	44.3
68.2	81.0	70.7	71.3	84.0	73.9	68.9	83.2	72.1	61.9	78.1	66.1	50.3	68.2	55.7	40.2	53.3	44.6	33.9	44.7	37.8
63.3	74.9	67.9	67.6	79.9	72.6	64.8	77.9	70.0	56.0	67.8	60.7	45.1	55.9	49.9	30.0	38.0	33.3	18.6	26.0	22.3
65.4	78.7	69.9	69.8	86.3	75.0	67.8	83.9	73.2	61.4	77.2	65.8	47.8	67.0	54.1	38.5	53.2	44.2	27.4	38.6	30.3
58.7	81.4	67.8	63.7	88.6	74.2	61.0	85.5	71.7	52.0	79.2	63.8	41.0	66.5	51.5	24.5	53.0	33.5	20.2	42.4	26.9
67.9	80.8	72.1	72.0	85.3	76.5	69.3	84.5	74.9	60.2	76.0	65.8	48.2	64.6	54.3	34.5	47.2	39.0	25.2	35.4	29.2
71.8	84.5	76.3	76.3	87.8	79.6	72.1	86.1	77.1	66.0	80.4	71.4	58.2	71.7	63.1	45.4	57.7	50.6	39.0	49.3	43.7
57.7	76.3	62.6	60.1	80.7	65.0	61.2	82.4	66.6	58.4	79.5	64.7	53.9	73.3	60.1	49.6	68.8	55.9	48.4	63.7	53.2
70.2	80.8	72.5	74.1	85.4	77.0	70.6	83.5	74.5	62.7	76.7	67.6	52.3	65.8	57.2	41.0	50.1	44.6	34.4	41.1	37.1
71.0	80.6	70.9	75.2	85.2	75.0	71.4	82.5	72.7	63.9	76.6	65.9	52.1	66.8	55.2	40.8	52.7	43.8	34.2	44.1	37.0
56.4	64.0	55.6	61.0	69.0	61.0	59.2	66.8	59.4	54.5	61.6	55.7	45.3	51.7	46.9	34.1	38.0	35.2	24.1	26.7	24.9
73.2	78.6	73.2	77.2	82.4	77.3	75.8	81.1	76.1	72.4	78.1	73.1	63.4	70.9	65.0	51.9	60.2	53.8	44.5	51.9	46.5
52.2	68.2	56.0	56.4	73.7	60.7	55.6	74.6	60.2	44.8	61.8	49.1	36.0	50.1	39.3	28.6	40.5	32.6	20.2	28.4	22.0
56.7	63.1	56.1	62.9	70.3	61.9	61.5	69.9	61.8	53.2	62.3	54.0	43.0	50.2	44.5	29.0	34.4	30.5	19.9	24.4	21.1
73.7	84.0	75.4	76.7	87.1	78.5	74.2	86.5	76.8	65.7	79.2	70.0	55.7	69.4	60.3	44.4	55.6	48.8	37.5	46.8	41.8
60.7	66.7	61.2	66.1	73.5	66.9	65.0	73.1	66.9	56.7	66.1	59.8	45.7	54.3	48.4	31.5	38.0	34.4	21.3	27.0	23.9
76.5	86.6	78.1	78.0	87.6	79.7	76.4	86.4	78.9	71.7	83.4	75.2	61.9	75.5	66.3	52.3	64.5	56.4	46.9	57.5	50.8
74.7	86.2	76.9	77.1	80.3	74.6	75.0	87.2	78.1	69.1	83.6	74.0	58.6	74.5	64.2	48.4	62.2	53.5	43.3	55.2	47.7
52.0	77.2	64.2	59.2	84.3	71.2	57 0	80.7	66.2	48.0	73.1	58.2	37.9	61.6	45.4	25.0	43.2	30.8	22.4	39.2	27.8
57.0	72.8	62.5	59.9	76.0	64.1	56.7	75.4	63.8	46.7	65.6	53.7	35.8	51.6	42.3	19.4	30.2	22.4	4.8	14.2	7.9
42.1	46.0	42.3	46.0	50.3	46.3	45.3	49.9	46.0	39.2	42.6	39.6	29.5	31.8	29.6	16.3	17.7	16.7	8.6	9.5	9.3
72.8	83.3	73.9	75.6	86.7	77.3	72.8	85.4	75.6	64.6	78.5	68.6	53.7	68.9	58.4	42.2	54.3	46.8	35.7	45.3	39.9
65.4	72.8	63.4	70.4	77.7	69.2	67.5	75.7	67.1	60.6	69.5	61.2	49.8	59.1	51.3	37.7	45.4	39.8	28.1	34.5	30.4
65.1	69.5	62.2	70.6	75.0	67.9	68.6	73.8	66.9	61.5	67.7	60.9	51.1	58.0	51.7	38.9	45.2	40.2	29.5	35.0	31.4
78.6	84.9	79.2	80.3	86.5	81.1	78.7	85.9	80.4	75.2	82.6	77.0	66.5	75.5	69.1	56.9	65.7	59.7	51.7	60.1	54.5
65.3	73.9	66.0	70.8	78.6	71.1	69.1	77.0	70.0	62.4	70.8	63.7	52.2	60.4	54.1	39.9	46.5	41.3	30.7	36.1	32.5
73.3	81.1	71.2	77.6	85.1	75.4	75.0	81.8	73.9	68.2	76.2	68.4	57.7	66.6	59.3	46.7	54.7	48.7	38.9	46.3	41.4
60.1	77.4	66.6	65.5	83.3	72.2	63.0	82.3	70.0	51.8	73.3	60.0	40.3	61.4	48.1	25.8	45.7	32.4	18.8	35.2	23.0
49.8	65.0	62.1	51.8	68.4	65.7	53.0	68.6	64.6	49.5	61.9	56.7	45.0	53.5	48.5	41.2	46.9	43.5	38.6	42.6	40.6
66.0	78.6	70.0	70.4	83.6	74.8	67.7	82.1	72.2	56.8	72.2	62.5	45.7	61.2	52.0	30.5	42.4	35.2	20.0	29.6	23.8
61.6	68.6	61.8	67.1	74.0	67.6	66.1	73.6	67.4	58.9	66.9	60.4	48.5	55.0	50.0	37.2	40.6	38.3	27.8	31.0	29.0
72.6	85.8	76.9	74.9	89.0	79.9	73.0	88.7	78.7	68.9	83.9	74.3	59.8	74.6	65.1	50.7	63.6	55.6	44.0	55.5	48.7
77.2	84.5	78.1	78.0	85.5	79.4	76.7	85.5	79.2	73.3	83.3	76.4	65.4	76.8	69.1	54.1	65.3	57.8	49.8	59.6	53.3
67.4	77.7	68.1	72.2	82.4	73.4	70.1	79.6	71.2	62.7	73.1	64.8	52.1	62.6	54.3	40.2	48.1	42.4	31.5	37.6	33.8
28.6	37.4	31.4	36.4	45.5	38.3	34.8	43.8	37.2	27.2	36.8	30.1	18.1	25.8	20.2	8.4	13.6	10.1	4.9	8.8	5.6
64.9	78.8	67.8	68.4	82.7	71.0	65.4	81.0	69.2	58.5	74.1	62.6	48.8	62.1	51.9	37.6	45.6	39.5	30.6	36.4	32.4
57.1	77.0	65.3	60.0	79.9	67.9	54.5	77.2	63.6	42.6	67.0	52.4	30.2	56.1	41.6	17.0	35.4	24.5	0	11.3	3.7
48.2	58.1	55.7	50.7	62.7	59.2	49.2	61.1	56.5	47.5	57.4	52.6	41.4	51.5	45.3	37.8	46.3	39.6	38.6	43.6	39.3
60.2	68.0	60.3	65.3	73.7	65.8	63.5	73.0	65.5	56.9	67.2	59.0	46.1	54.9	48.3	33.6	39.6	35.0	24.3	29.1	25.9
61.9	69.8	60.6	67.1	75.0	65.9	64.8	73.1	64.7	57.4	65.7	59.3	47.0	54.8	48.5	35.7	41.6	37.1	25.1	30.8	26.8
53 8	68.1	63.6	56.9	72.7	69.1	56.2	72.1	67.6	53.0	67.7	61.6	47.8	58.5	52.7	42.1	48.5	44.8	38.9	43.7	41.2
51.3	80.9	67.3	60.9	84.3	73.2	60.0	80.7	69.7	50.4	76.9	62.6	40.1	66.3	50.8	29.4	54.9	38.8	27.3	49.3	35.2
63.7	84.6	79.1	68.5	91.1	86.3	67.6	91.1	84.8	61.5	80.9	74.2	53.4	70.2	62.6	46.0	59.1	52.3	42.3	51.5	47.3
75.1	93.4	79.8	77.9	97.0	83.5	76.9	94.6	81.4	73.6	90.7	79.1	66.5	83.7	72.2	58.2	73.5	63.4	52.5	68.3	58.9
62.6	71.5	62.8	67.0	76.3	67.5	65.0	75.0	66.2	58.3	67.7	59.5	47.1	55.2	48.6	34.6	39.7	35.3	26.1	29.5	27.3
51.0	68.9	63.7	54.2	73.8	69.5	53.4	73.0	68.7	50.0	68.8	62.9	44.6	57.2	51.3	40.0	47.3	43.8	39.5	44.6	42.1
58.7	77.5	69.9	60.8	82.4	73.7	60.4	82.4	73.1	58.5	78.7	69.9	51.6	68.7	61.0	45.2	58.3	53.1	43.1	51.5	48.0
69.4	80.9	73.2	73.7	85.3	77.7	70.9	83.7	75.8	62.4	76.0	67.8	51.7	65.3	57.0	38.6	48.5	42.8	30.4	38.2	33.9
41.7	47.5	48.8	50.1	54.9	55.9	44.9	48.8	49.5	41.5	45.2	45.1	28.6	31.6	31.2	14.2	16.7	16.0	3.4	5.8	5.4
61.5	74.0	65.3	65.7	79.5	70.0	63.0	77.5	67.7	52.4	66.5	57.4	42.0	54.2	45.9	26.4	35.0	30.1	14.5	22.0	17.3
54.5	70.6	59.8	57.1	73.6	62.6	54.1	73.1	60.8	43.7	62.5	50.3	34.0	48.3	39.3	16.6	25.9	19.0	1.7	9.9	4.0
59.3	76.4	66.8	66.7	85.0	75.0	66.0	83.7	74.1	55.8	73.3	63.0	46.2	51.8	50.4	34.0	44.4	37.3	29.7	37.7	32.1
74.6	89.6	80.1	75.6	91.0	81.9	74.8	90.7	81.0	70.6	86.0	75.8	62.4	78.8	68.1	51.9	66.8	57.0	47.2	61.5	52.7
60.4	69.5	63.1	63.5	72.4	65.7	65.3	74.2	67.8	62.7	72.1	65.5	57.9	68.8	61.2	52.5	65.7	56.5	50.2	62.6	54.1
64.7	72.2	66.0	69.8	77.5	71.8	67.8	75.9	70.3	61.3	70.4	64.1	51.3	59.3	54.1	38.2	44.0	40.0	29.8	33.8	31.1
65.6	73.5	65.6	71.5	78.9	71.5	70.0	77.2	70.7	64.3	71.6	65.5	54.2	60.8	55.5	42.6	47.9	44.2	33.1	37.5	34.8
77.4	84.0	74.9	78.6	86.5	77.3	77.4	86.0	76.8	75.4	83.8	76.0	70.0	78.8	70.8	60.4	72.7	62.5	55.0	68.1	58.1
54.2	63.8	57.2	54.8	63.5	57.1	55.0	63.6	57.1	55.7	65.5	58.3	55.1	63.9	58.2	52.4	59.0	55.8	49.2	54.2	52.3
56.0	75.4	63.5	60.3	77.6	66.7	58.2	75.0	64.6	49.9	69.4	57.5	40.6	59.9	47.9	29.4	45.6	35.0	24.0	39.6	29.0
78.2	84.7	77.1	81.1	87.3	79.8	78.2	85.2	78.2	72.7	80.8	74.2	62.3	72.8	65.4	52.6	64.2	56.7	46.6	58.3	51.1
50.4	69.4	60.1	52.9	75.6	64.7	51.0	75.5	64.1	43.8	63.5	51.6	35.9	50.6	40.9	27.4	39.3	30.9	20.2	28.8	22.7
74.6	88.5	78.2	77.3	91.1	80.7	75.9	90.2	79.8	68.7	83.6	73.1	58.6	74.7	64.5	47.5	62.1	53.3	42.8	55.1	47.7
70.2	86.1	75.8	73.6	91.2	80.0	71.0	90.0	78.3	63.8	83.7	71.7	53.5	72.5	60.5	39.6	58.0	46.3	30.8	46.8	36.6
48.7	54.0	53.1	51.8	56.7	55.9	53.3	58.7	57.7	49.9	54.6	52.6	43.7	47.8	45.6	38.9	40.8	39.6	35.2	36.7	35.9
74.5	81.0	74.6	78.5	85.2	78.8	76.3	83.4	77.7	71.4	79.1	73.3	61.6	70.7	64.2	50.4	60.2	53.5	43.9	52.4	47.1

Mean a. m., p. m., and midnight temperatures (in degrees Fahrenheit) at stations of the

Stations.	January.			February.			March.			April.			May.		
	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.
Spokane Falls, Wash	18.8	26.3	24.1	23.4	32.2	29.9	32.6	45.6	42.0	39.4	54.8	49.7	46.0	63.9	59.3
Springfield, Ill	23.1	29.5	25.5	27.8	36.0	31.4	35.0	44.8	39.3	47.7	59.4	52.6	60.6	70.1	63.3
Stanton, Fort, N. Mex	25.0	42.3	32.8	27.0	50.6	36.5	26.0	51.3	40.2	37.1	59.8	49.1	(1)	(1)	(1)
Stockton, Fort, Tex[2]	33.9	54.6	40.5	38.8	61.1	46.7	45.6	69.1	55.1	51.5	77.5	62.6	63.3	81.7	70.9
Sully, Fort, Dak	1.8	16.0	9.5	11.8	26.5	17.8	18.4	32.1	24.4	34.0	52.1	42.3	51.0	68.8	58.2
Tatoosh Island, Wash	39.8	41.2	41.1	41.2	42.5	42.3	43.1	46.0	44.5	45.7	49.7	47.5	48.7	53.1	51.0
Thomas, Fort, Ariz	29.7	50.6	40.5	34.8	57.9	47.7	40.6	64.0	54.4	44.5	73.0	61.1	52.4	84.5	71.0
Toledo, Ohio	23.7	29.9	25.9	25.1	32.7	28.6	31.5	39.6	34.8	43.8	52.6	46.2	56.6	66.1	58.1
Totten, Fort, Dak	−10.2	−3.2	−9.4	−2.6	7.4	2.2	12.8	23.2	16.8	33.7	48.8	39.2	44.9	61.5	51.2
Unalashka, Alaska[3]	32.9	34.3	34.3	29.8	31.0	31.0	30.8	33.4	33.2	33.0	36.7	36.4	38.0	41.4	42.3
Valentine, Nebr	0.7	14.3	6.3	19.6	34.8	26.7	19.6	33.6	26.8	35.8	50.9	44.7	52.3	70.4	60.5
Vicksburg, Miss	42.0	52.2	46.7	45.9	58.9	52.1	52.0	65.9	57.9	58.9	73.3	64.4	67.3	80.8	71.3
Walla Walla, Wash	23.6	28.3	25.5	38.0	47.6	44.0	39.0	49.5	45.0	45.0	58.1	53.0	52.2	68.7	63.4
Washington City	29.1	37.2	31.7	31.2	41.4	34.1	36.7	47.7	40.1	47.7	60.2	50.4	59.5	71.8	61.0
Wilmington, N. C	42.3	52.5	45.3	44.4	55.7	47.9	49.7	60.3	52.6	57.9	67.9	59.0	66.9	75.7	66.6
Winnemucca, Nebr	23.2	36.4	29.6	27.6	41.8	34.5	31.5	50.4	41.2	37.0	56.5	47.5	41.6	64.9	55.1
Yankton, Dak	8.4	20.9	13.0	13.4	27.0	19.3	23.6	37.1	29.1	37.8	54.2	44.1	52.6	67.8	57.8
Yuma, Ariz	45.8	62.3	53.0	50.0	68.4	59.2	53.6	74.8	65.0	56.7	80.5	70.0	64.6	89.5	78.3

[1] No record. [2] Station closed June 20, 1886. [3] Station closed May 22, 1886.

Signal Service, United States Army, for each month of the year, etc.—Continued.

June.			July.			August.			September.			October.			November.			December.		
A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.	A. M.	P. M.	Mid.
53.7	70.7	67.5	56.4	77.8	73.4	54.7	77.2	71.3	46.5	64.7	57.9	38.8	51.3	46.6	31.7	40.0	35.7	26.8	32.8	30.4
66.3	77.8	70.0	70.8	83.8	75.4	67.6	81.5	72.6	59.6	74.4	65.1	51.2	63.8	55.9	38.0	47.4	41.8	28.5	34.9	31.2
50.8	76.2	63.1	56.8	79.0	67.8	56.3	75.3	63.9	48.9	68.0	55.2	38.8	62.9	47.1	31.2	53.2	88.7	27.6	50.8	35.3
68.4	90.3	77 6	70.8	91.5	79.7	68.0	88.9	76.9	62.1	83.0	70.5	53.9	75.1	61.4	41.8	62.2	47.7	36.8	56.8	43.0
59.8	78.5	66.2	66.3	83.2	72.7	63.3	85.5	71.3	51.2	72.9	59.8	37.9	59.2	46.7	21.5	34.8	27.1	12.0	25.1	17.5
51.1	56.7	51.0	54.0	59.6	56.7	53.6	58.5	56.3	52.5	55.9	54.2	48.8	51.2	49.9	45.8	47.3	46.8	42.1	43.1	42.9
61.2	93.9	80.7	71.3	95.6	84.5	70.2	91.3	81.1	59.9	85.9	73.3	46.6	75.1	60.8	35.3	61.7	47.6	32.0	55.0	42.9
66.7	75.0	67.1	70.2	79.8	71.6	67.0	77.3	69.6	59.2	70.5	62.4	48.8	58 8	52.3	36.3	43.1	38.8	27.7	33.0	29.8
54.8	69.3	58.6	61.2	76.4	65.7	55.6	73.3	61.1	44.5	63.7	51.2	35.3	52.2	41.0	18.7	29.6	22.1	1.6	10.2	3.7
43.2	47.1	47.5	47.5	50.4	51.3	48.4	52.5	52.8	45.2	49.0	48.5	39.2	42.3	42.0	33.8	36.2	35.6	32.3	32.5	32.3
57.0	73.6	64.7	66.3	85.9	74.8	62.3	82.3	71.1	49.9	70.5	58.6	40.0	59.9	47.6	27.5	41.8	31.4	18.0	31.5	22.5
75.1	87.0	77.1	76.9	89.1	79.2	74.8	88.4	77.9	68.6	83.5	73.2	58.9	74.2	63.7	49.1	62.4	53.7	44.5	56.1	49.3
58.9	74.3	70.7	66.3	83.0	80.7	63.4	81.0	76.9	56.1	71.8	64.1	45.1	55.4	50.1	35.4	43.6	40.4	37.8	42.8	40.8
69.5	80.3	70.1	73.7	84.8	74.3	70.4	81.7	71.6	63.0	75.6	65.0	51.8	65.0	54.5	30.9	50.2	42.6	31.7	40.1	34.6
74.4	81.8	73.3	77.9	83.6	77.5	75.7	83.4	76.2	69.9	79.3	71.3	50.4	71.0	62.0	49.5	61.3	52.7	42.8	54.1	46.4
50.3	74.7	65.4	56.2	84.9	74 2	54.3	85.3	73.3	45.4	74.0	61.3	35.2	59.0	46.4	26.7	44.7	35.0	25.7	40.3	32.1
62.1	76.7	66.5	66.9	81.8	71.9	63.7	81.4	70.3	52.8	72.0	59.2	41.3	59.4	47.5	26.0	40.6	30.1	15.3	26.9	19.1
71.1	98.0	86.2	80.0	103.0	92.6	80.4	100.9	90.8	72.0	96.0	83.8	61.5	83.4	70.6	51.8	71.2	59.3	48.0	65.7	54.8

APPENDIX No. 26.

Normal precipitation (in inches and hundredths) and departure of 1886 therefrom,

[The normal has been computed from the commence-

Stations.	January.		February.		March.		April.		May.	
	Normal.	Departure + or -.	Normal.	Departure + or -.	Normal.	Departure + or -.	Normal.	Departure + or -.	Normal.	Departure + or -.
Abilene, Tex	0.11	±0.0	0.61	±0.0	2.47	±0.0	1.67	±0.0	0.33	±0.0
Albany, N. Y	2.84	+0.82	2.62	-1.22	2.75	-0.02	2.87	+0.80	2.91	+0.49
Alexander, Fort, Alaska[1]	3.19	-2.13	1.07	+0.56	3.06	-0.21	1.67	-0.36	2.43	-0.04
Alpena, Mich	2.34	+2.82	2.06	-0.76	2.23	+3.33	1.97	+1.54	3.66	-1.89
Apache, Fort, Ariz	1.52	+2.38	1.97	+0.76	1.74	-0.68	0.79	+0.12	0.57	-0.57
Assiniboine, Fort, Mont	1.24	+0.26	0.61	+0.16	0.68	+0.17	0.96	+0.87	1.23	-0.24
Atlanta, Ga	7.34	-0.01	5.20	-3.67	7.29	+3.87	4.85	-2.33	3.58	+2.63
Atlantic City, N. J	3.94	-0.77	3.46	+1.46	3.83	-0.43	3.37	-1.51	2.53	+1.62
Augusta, Ga	4.62	-0.93	3.79	-2.09	5.60	+1.82	4.18	-2.32	3.50	+2.79
Baltimore, Md	3.25	+1.23	3.50	+1.99	4.00	+0.85	3.01	-0.95	3.21	+3.86
Behring's Island, Behring Sea[3]	0.70	-0.04	1.59	-0.09	0.91	+0.42	1.13	+0.12	0.96	([2])
Benton, Fort, Mont.[4]	0.80	-0.13	0.52	+0.13	0.73	-0.03	0.96	+1.05	2.39	-2.03
Bidwell, Fort, Cal	4.65	+1.13	2.23	-0.07	2.70	-1.22	2.83	-0.63	1.61	-0.17
Bismarck, Dak	0.54	+0.08	0.64	-0.10	1.05	-0.11	2.78	-1.29	2.91	-1.18
Block Island, R. I	5.58	+1.46	6.41	+2.48	4.26	+1.16	3.37	-0.11	4.76	-0.62
Boisé City, Idaho	2.39	+0.57	1.73	-0.79	1.25	-0.43	1.21	+1.22	1.21	-0.66
Boston, Mass	4.44	+2.64	3.85	+3.19	4.61	-1.41	3.87	-2.17	3.50	-0.42
Bridger, Fort, Wyo	0.32	+0.24	0.42	+0.01	0.54	+0.28	1.36	-0.12	0.93	-0.73
Brownsville, Tex	2.15	-0.34	1.82	+0.51	1.24	-0.09	0.61	-0.44	3.72	+2.85
Buffalo, N. Y	2.79	+1.43	2.57	+1.43	2.97	+1.26	2.49	+0.76	3.15	+1.54
Buford, Fort, Dak	0.69	-0.28	0.52	+0.19	0.43	-0.12	1.45	+0.80	1.94	-0.50
Cairo, Ill	4.16	-0.34	4.22	-1.68	3.89	-1.05	4.28	+2.36	4.12	-1.14
Canby, Fort, Wash	6.49	-0.16	7.06	-2.29	3.86	+4.40	3.18	+2.26	2.73	+0.70
Cape Henry, Va.[5]	4.81	-1.82	3.58	-0.19	5.57	-3.82	4.91	-2.93	3.63	+3.62
Cape Mendocino, Cal.[5]	2.68	+1.93	1.89	-0.52	1.90	+0.18	3.15	+2.28	0.74	-0.39
Cedar Keys, Fla	4.73	-2.87	3.38	-2.21	4.53	+7.61	2.38	-0.77	2.43	-1.72
Charleston, S. C	4.21	+1.43	3.59	-1.46	4.18	-1.58	4.45	-3.26	4.15	-3.15
Charlotte, N. C	6.30	-1.36	4.40	-1.64	5.41	+0.98	4.47	-0.59	4.29	+6.75
Chattanooga, Tenn	7.86	-1.08	5.12	-1.84	7.07	+5.70	5.14	-0.62	4.01	+1.62
Cheyenne, Wyo	0.28	+0.24	0.26	+0.58	0.61	+0.75	1.23	-0.09	2.14	-1.82
Chicago, Ill	2.16	+1.40	2.27	-0.76	2.74	-0.95	3.48	-2.19	3.64	-2.64
Chincoteague, Va	4.78	-0.75	4.00	+1.11	3.74	-1.35	2.21	+0.38	3.32	+2.86
Cincinnati, Ohio	3.56	-0.73	3.84	-2.19	3.56	-1.29	3.17	-0.94	3.58	+0.53
Cleveland, Ohio	2.50	+0.85	2.62	-1.07	2.86	-0.86	2.40	-0.62	3.15	-1.47
Columbus, Ohio	3.33	+1.03	3.54	-2.28	3.27	+0.63	3.26	+0.31	5.07	+2.60
Concordia, Kans	0.62	±0.0	0.88	±0.0	2.56	±0.0	3.39	±0.0	3.64	+1.01
Custer, Fort, Mont	1.03	-0.53	0.49	+0.25	0.46	-0.10	1.19	+0.79	2.44	-1.88
Davenport, Iowa	1.74	+0.48	1.55	-0.03	2.26	-0.82	2.95	-1.11	4.24	-0.51
Davis, Fort, Tex	0.58	-0.36	0.21	+0.18	0.39	-0.13	0.53	-0.43	1.43	-1.26
Deadwood, Dak	1.04	+0.24	1.26	+0.52	1.99	+0.13	5.02	+1.70	4.70	-3.69
Denver, Colo	0.64	-0.02	0.50	+0.22	0.97	+1.39	2.10	+0.69	2.89	-2.80
Des Moines, Iowa	1.33	+2.14	1.42	-0.90	1.34	+0.07	2.98	+1.34	5.34	-1.33
Detroit, Mich	2.10	-0.18	2.33	-1.03	2.61	-0.91	2.34	+0.96	3.55	-1.22
Dodge City, Kans	0.41	+1.41	0.53	-0.07	0.87	+0.63	1.30	+0.60	4.00	-3.60
Dubuque, Iowa	1.60	+1.57	1.50	-0.14	2.43	+1.89	2.91	-0.79	3.92	+0.25
Duluth, Minn	1.06	+1.20	1.14	+0.67	1.56	-0.49	2.26	+2.71	3.74	-1.81
Eastport, Me	3.75	+5.26	4.07	-0.82	5.11	-2.83	3.61	-2.47	4.46	-0.97
Elliott, Fort, Tex	0.35	+0.27	0.56	+0.86	0.67	+0.82	1.58	+0.86	5.08	-4.85
El Paso, Tex	0.58	-0.27	0.44	±0.0	0.49	-0.21	0.18	-0.18	0.40	-0.39
Erie, Pa	3.56	+1.24	3.27	+0.16	3.07	-0.04	2.54	+0.51	3.50	-2.02
Escanaba, Mich	1.52	+3.28	1.40	+0.44	1.84	+1.31	1.96	+0.32	3.75	-2.22
Fort Smith, Ark	2.14	+0.38	5.10	-2.72	2.04	+0.98	5.47	+1.82	3.08	-2.70
Frisco, Utah	0.54	±0.0	0.19	±0.0	0.28	±0.0	0.15	±0.0	([7])	±0.0
Galveston, Tex	4.07	-0.62	2.82	-0.51	3.14	+0.05	3.23	-1.08	4.30	-4.27
Grand Haven, Mich	2.39	+0.23	2.20	+1.30	2.53	+0.51	2.64	+0.20	3.33	-1.34
Grant, Fort, Ariz	0.91	+1.55	1.26	+0.03	1.32	-0.79	0.23	+0.07	0.37	-0.33
Greencastle, Ind.[8]	3.96	+0.69	2.17	+0.10	2.03	+1.37	3.94	-0.67	2.87	-0.50

[1] Station closed June 12, 1886.
[2] No record.
[3] Station closed May 7, 1886.
[4] Station closed December 8, 1886.

APPENDIX No. 26.

at stations of the Signal Service, U. S. Army, for each month of the year.

ment of observations to December, 1886, inclusive.]

June.		July.		August.		September.		October.		November.		December.	
Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.
3.38	±0.0	1.48	±0.0	2.03	±0.0	4.17	±0.0	2.42	—0.18	0.44	+0.21	0.49	—0.49
3.85	—0.66	4.18	—1.62	3.48	—2.61	3.29	+0.78	3.22	—0.79	2.89	+2.51	2.61	—0.42
1.88	(2)	4.13	(2)	4.48	(2)	4.98	(2)	1.99	(2)	2.84	(2)	1.30	(2)
3.87	+0.15	3.32	—1.81	3.72	—0.24	4.64	+0.67	4.47	—2.67	2.98	+1.75	2.36	—0.39
0.90	—0.71	3.78	—1.88	4.74	+0.01	1.78	+1.38	1.67	—0.01	0.99	—0.43	1.94	—1.70
1.98	—0.60	2.79	—2.32	1.68	—1.33	1.31	+0.16	0.54	—0.03	0.92	—0.18	0.72	—0.10
4.88	+3.80	3.21	—1.13	4.05	—1.69	2.93	—2.40	2.36	—2.33	4.67	+0.65	5.32	—2.29
3.13	—0.57	3.37	+1.36	4.96	—1.38	3.15	—2.26	3.23	+4.93	3.70	—0.25	4.17	—0.24
4.41	+5.24	4.57	+2.94	4.58	—2.29	3.70	—3.05	2.13	—1.99	3.77	—2.48	3.81	—0.26
4.10	+1.54	4.56	+3.52	4.46	—0.52	3.73	—1.83	2.99	—1.60	3.17	+0.92	3.13	—0.01
1.66	(2)	2.46	(2)	2.09	(2)	2.50	(2)	2.60	(2)	2.96	(2)	1.62	(2)
2.16	—0.63	1.82	—0.92	1.08	—0.42	1.04	+0.20	0.79	(2)	0.78	(2)	0.64	(2)
2.49	—1.71	0.61	—0.20	0.06	—0.02	0.50	—0.50	0.95	+0.41	3.17	—2.11	4.93	—0.68
3.40	—1.37	2.28	—0.85	2.60	—1.15	1.24	—0.86	1.19	—0.54	0.75	+0.49	0.77	—0.01
4.00	—1.85	2.97	—1.29	3.26	—0.79	3.07	—0.17	5.08	—0.37	4.54	+0.62	4.92	+1.78
0.90	—0.46	0.21	+0.03	0.08	—0.08	0.51	—0.51	1.44	—0.72	0.84	—0.41	2.25	+0.39
3.51	—2.17	3.64	—1.83	4.58	—0.89	2.96	—0.23	4.22	—0.95	5.01	—1.42	3.54	+0.12
0.93	+0.23	0.29	—0.17	1.03	+0.14	0.71	—0.65	0.77	+0.16	0.59	+0.70	0.56	—0.24
2.27	+5.51	2.40	+2.48	4.45	—1.37	7.89	+22.68	4.64	—4.09	2.13	—1.65	2.00	—1.31
3.37	+0.02	3.52	+2.18	3.39	—0.62	3.34	+2.64	3.82	—2.15	3.58	+2.47	3.45	—0.19
2.88	—1.95	2.31	—1.75	1.15	—0.28	0.69	—0.64	0.93	+0.64	0.41	+0.18	0.82	—0.27
4.55	+0.32	3.85	—2.84	2.76	+0.08	2.71	—0.19	3.11	—2.06	4.05	+1.68	3.56	—1.82
2.72	—0.05	1.76	+1.57	0.81	+0.26	4.00	—0.86	5.15	+0.09	7.64	—3.17	9.92	+7.43
3.68	+0.55	5.78	—1.41	4.97	+0.30	4.99	—0.01	3.57	—2.94	4.02	—1.26	4.38	+0.78
0.58	—0.54	0.31	+0.15	0.28	—0.02	0.91	—0.76	1.88	+1.16	2.52	—1.45	2.76	+0.73
7.08	+0.73	9.04	+2.68	9.21	—2.13	4.96	—3.58	3.38	—0.85	2.86	—1.78	3.14	—1.19
5.66	+5.12	7.16	—3.00	7.84	—4.56	6.32	—3.29	4.59	—4.58	3.08	—2.75	3.67	—1.88
4.98	+6.06	6.12	+1.93	4.80	+1.54	2.94	—2.26	3.29	—2.95	3.93	—1.05	5.30	+0.96
4.96	+2.88	3.68	—0.83	4.20	—0.24	3.76	—2.65	3.24	—1.96	4.93	+0.49	5.31	—2.22
1.51	+0.01	1.66	—0.95	1.52	+0.09	0.89	+0.16	0.64	—0.27	0.31	(6)	0.21	(6)
4.14	—3.20	3.70	—2.17	3.24	+0.14	3.05	+3.88	3.68	—2.26	2.77	—1.11	2.26	—0.50
2.38	+0.09	4.00	+0.62	4.37	+2.34	2.38	—1.35	2.77	—0.86	3.58	+0.07	4.15	+0.39
4.77	+0.49	3.87	—0.80	4.01	—1.10	2.26	—0.96	2.80	—1.98	3.25	—0.02	3.70	—2.03
4.24	—3.23	4.19	—1.55	3.28	—1.92	3.79	+0.25	2.94	—2.47	2.76	+1.18	2.75	+0.82
3.83	—1.14	3.71	+0.46	3.71	—1.27	2.64	+0.97	3.21	—2.08	3.40	+0.78	3.54	—0.13
2.16	+1.04	4.20	—0.71	1.94	+0.52	3.71	+0.18	1.86	—0.61	0.95	+0.34	0.50	+0.06
2.80	+0.10	1.21	+0.38	1.16	—0.45	0.73	—0.07	0.98	+0.65	0.45	—0.09	0.96	+0.30
4.53	—4.04	3.57	—3.14	4.11	—1.44	3.29	—0.86	3.11	+0.36	1.97	—1.23	1.63	—1.10
2.24	—0.06	3.32	—2.04	4.91	—2.94	2.49	+2.84	1.98	—1.27	0.40	—0.37	0.35	—0.35
3.93	—1.98	2.36	+0.09	2.06	—0.22	0.84	+0.22	1.49	—0.53	1.35	+1.89	1.50	+0.01
1.57	+0.69	1.68	—1.18	1.54	+0.08	0.92	+0.06	0.72	—0.39	0.77	+1.16	0.74	+0.13
7.07	—5.86	3.85	—3.58	3.58	—2.48	3.90	+4.03	4.43	—1.81	2.29	—0.43	1.50	—0.69
3.67	—1.60	3.93	—1.48	2.92	—0.90	2.70	+1.50	2.62	—1.58	2.46	—0.29	2.73	—0.52
3.16	+2.31	3.50	—1.43	3.23	—0.77	1.37	+0.96	1.25	—0.80	0.60	—0.36	0.76	—0.51
5.31	—4.60	5.06	—4.17	3.62	—2.95	4.74	—1.64	3.20	+0.88	2.18	—0.29	1.84	—0.81
5.33	+0.02	3.90	—2.42	3.41	—1.18	4.53	+1.52	2.95	—0.50	1.79	+1.05	1.31	—0.38
3.89	—3.23	4.66	—2.93	3.27	—0.86	3.58	—0.85	4.67	(2)	4.73	(2)	4.18	+2.33
3.99	—0.54	2.90	—1.40	3.63	+0.94	2.23	(2)	3.13	+1.91	0.58	—0.40	0.90	—0.81
0.54	+0.49	2.85	—1.23	2.23	—0.38	1.21	—0.05	1.37	—0.57	0.48	+0.04	0.67	—0.63
4.07	—1.30	3.27	—1.11	3.27	—1.74	4.18	—0.92	4.34	—2.61	4.69	+1.52	3.46	+0.58
4.45	—2.24	3.27	—1.35	4.20	+0.18	4.20	—0.14	3.82	—0.79	2.65	—0.39	1.78	—0.88
3.92	+2.17	3.42	—0.79	2.24	—0.42	3.68	+0.54	3.49	—1.96	3.18	—0.52	2.64	—1.85
(7)	±0.0	0.75	+0.60	3.74	—0.22	0.09	+0.02	0.56	+0.10	1.10	+0.13	0.10	—0.05
4.32	+1.87	3.36	—2.16	4.94	—2.48	7.92	+5.39	5.29	—3.36	4.86	—2.21	4.60	—2.50
4.47	—2.16	3.24	—2.34	3.22	+3.35	4.03	+0.78	3.95	—1.45	3.14	—0.58	2.56	—0.89
0.80	(2)	3.34	(2)	3.34	+0.06	1.46	+2.03	0.89	—0.32	0.57	—0.47	1.56	—1.47
6.12	—2.53	2.88	—1.35	5.89	—1.36	5.68	—0.32	1.85	—1.23	2.14	(2)	5.31	(2)

[5] Station closed December 31, 1886.
[6] Record incomplete.
[7] Inappreciable.
[8] Station closed November 10, 1886.

Normal precipitation (in inches and hundredths) and departure of 1886 *therefrom*

Stations.	January.		February.		March.		April.		May.	
	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.
Hatteras, N. C	6.68	+0.49	4.94	−2.65	7.19	−3.04	5.32	−2.35	4.06	−1.35
Helena, Mont	1.73	−0.91	0.72	−0.16	0.48	+0.52	2.43	+0.26	0.97	−0.57
Huron, Dak	0.21	+0.27	0.34	−0.18	0.70	−0.08	2.72	+0.80	3.73	−2.15
Indianapolis, Ind	2.91	+1.11	3.47	−1.96	3.85	−1.00	3.54	−0.45	4.23	−0.41
Indianola, Tex.[1]	2.32	+0.19	1.93	+1.36	2.60	+0.56	1.79	−0.99	3.27	−3.07
Jacksonville, Fla	3.61	−0.80	3.40	−1.53	3.50	+3.24	3.28	−0.20	4.10	−1.29
Keeler, Cal	0.49	±0.0	0.14	±0.0	0.36	+0.24	0.61	−0.21	0.0	±0.0
Keokuk, Iowa	1.69	+0.39	1.69	−0.29	2.22	+0.03	3.01	−1.49	4.10	+0.39
Key West, Fla	2.34	−0.89	1.86	−1.73	0.70	+0.60	1.37	+0.62	3.73	−3.62
Kitty Hawk, N. C[2]	6.07	+0.16	4.01	+0.37	5.96	−1.06	5.54	−0.54	3.60	+3.67
Knoxville, Tenn	6.06	+0.06	4.86	−2.24	6.08	+5.07	5.51	−0.21	3.60	+1.32
La Crosse, Wis	1.31	+2.13	1.09	−0.28	1.68	−0.32	2.00	−0.31	3.18	−2.29
Lamar, Mo	2.91	±0.0	1.22	±0.00	1.60	+0.34	4.21	−2.43	4.30	−0.71
Las Animas, Colo	0.32	+0.36	0.30	−0.17	0.43	−0.10	1.21	+1.43	2.35	−2.10
Leavenworth, Kans	1.35	+0.25	1.47	−0.86	2.27	−0.92	3.71	−2.24	5.08	−0.37
Little Rock, Ark	4.59	−0.62	7.14	−2.87	4.63	−1.18	5.79	−2.70	5.68	−4.55
Los Angeles, Cal	2.70	+5.08	3.50	−2.09	2.95	−0.43	2.15	+1.17	0.45	−0.44
Louisville, Ky	4.26	+0.38	4.51	−2.57	4.08	−0.66	4.52	−1.14	3.95	+0.08
Lynchburgh, Va	4.46	+0.10	3.47	+0.34	3.97	+1.82	3.49	+1.33	3.30	+3.44
Mackinaw City, Mich	4.98	−2.73	3.22	−2.03	1.48	+0.49	1.22	+0.11	2.42	−1.41
Macon, Fort, N. C.[3]	5.86	−1.00	2.96	−0.62	5.26	−0.62	3.70	−0.81	3.85	−1.52
Maginnis, Fort, Mont	1.59	+0.81	1.06	+0.86	1.24	+1.01	0.80	+0.38	0.86	−0.32
Marquette, Mich	1.39	+1.75	1.38	−0.20	1.45	+0.74	1.74	+0.40	2.88	+1.71
Memphis, Tenn	5.86	−1.31	5.58	+0.85	5.78	−2.78	6.17	−3.29	4.58	−2.47
Milwaukee, Wis	2.25	+2.77	1.88	+0.48	2.69	+0.73	2.92	−0.15	3.39	−0.72
Mobile, Ala	5.45	+0.67	4.32	−2.17	8.20	+6.42	5.96	−0.10	4.62	−3.35
Montgomery, Ala	5.10	+1.59	5.28	−1.18	6.51	+0.35	6.34	+1.04	4.03	−1.08
Montrose, Colo	0.79	±0.0	0.18	−0.05	0.58	−0.09	2.50	+0.64	0.72	−0.15
Moorhead, Minn	0.77	+0.17	0.98	−0.20	0.88	−0.74	2.38	+3.11	3.04	−0.53
Mount Washington, N. H.	4.28	+0.57	4.33	+4.70	6.12	−3.01	5.44	−2.08	6.30	−3.05
Nashville, Tenn	5.23	−0.05	5.23	−1.41	5.22	−0.46	5.33	−2.97	3.55	−1.45
New Haven, Conn	4.18	−0.65	4.37	+1.58	4.77	−1.57	3.96	−0.75	3.54	−0.80
New London, Conn	4.41	+2.98	4.18	+7.80	4.81	−0.17	3.85	−0.22	3.55	−0.10
New Orleans, La	5.84	+1.69	4.01	−2.05	6.15	+2.26	6.14	−0.54	5.38	−2.31
New York City	3.76	+1.26	3.69	+2.21	3.88	−0.34	3.27	+1.68	3.05	+3.48
Norfolk, Va	3.97	−1.04	3.90	+0.13	4.44	−2.08	3.92	−0.76	3.86	+4.46
North Platte, Nebr	0.52	−0.43	0.35	−0.18	0.61	+0.02	1.84	+0.25	3.16	+0.51
Olympia, Wash	8.59	+0.88	8.80	−5.41	4.81	−0.74	3.79	+0.25	2.53	−0.63
Omaha, Nebr	0.59	+0.56	0.80	−0.44	1.48	−0.17	3.44	−1.67	4.95	−0.37
Oswego, N. Y	3.10	+0.19	2.47	−0.28	3.10	+0.63	2.10	+1.56	2.77	−0.85
Palestine, Tex	4.38	−0.73	3.43	+0.52	3.64	+0.98	4.43	−1.68	6.81	−6.51
Pensacola, Fla	5.55	−0.25	3.97	−1.79	5.68	+7.69	5.33	+1.50	3.86	−3.11
Philadelphia, Pa	3.40	+0.29	3.27	+1.35	3.18	−0.01	2.98	−0.28	3.00	−1.50
Pike's Peak, Colo	1.72	+2.32	1.45	−0.61	2.11	+2.61	3.71	+2.62	3.89	−3.49
Pittsburg, Pa	3.10	+0.11	2.43	−1.04	2.96	−0.11	2.60	+1.43	2.83	+0.68
Poplar River, Mont	0.50	−0.10	0.46	−0.08	0.32	−0.12	0.79	+0.07	1.45	−0.10
Port Angeles, Wash	5.91	−0.37	3.75	−0.77	1.44	+1.79	1.69	+0.98	0.96	−0.19
Port Huron, Mich	2.03	+0.16	2.46	−0.35	3.51	−0.69	2.18	+0.30	3.25	+1.04
Portland, Me	3.39	+1.26	3.41	+2.11	3.15	+0.11	2.94	−0.66	3.22	+0.85
Portland, Oregon	7.05	+2.28	7.39	−5.43	6.36	−0.97	3.31	−0.15	2.44	−1.12
Prescott, Ariz	1.44	+4.55	1.33	−0.18	1.57	+1.47	0.92	+0.26	0.50	−0.47
Red Bluff, Cal	5.47	−0.62	3.63	−3.45	2.91	−1.60	2.93	−1.19	1.08	−0.35
Rio Grande City, Tex	1.19	−0.12	1.14	+0.58	1.08	+0.43	0.96	−0.86	3.39	+1.81
Rochester, N. Y	3.30	−0.72	2.53	−0.35	3.21	−0.36	2.64	+1.41	3.14	−0.16
Roseburg, Oregon	6.20	+1.39	4.56	−2.12	3.44	−0.41	3.02	+1.96	1.82	−0.71
Sacramento, Cal	4.21	+3.74	3.06	+2.77	3.27	−0.59	3.48	+0.60	0.62	−0.55
Saint Louis, Mo	2.23	+0.88	2.90	−1.19	2.87	+0.17	3.42	−1.32	3.97	+3.87
Saint Michael's, Ft., Alaska[5]	0.86	−0.43	0.18	+0.16	0.46	±0.0	0.49	−0.37	0.99	+0.54
Saint Paul, Minn	1.03	+0.73	0.97	−0.72	1.52	−0.43	2.25	+1.42	3.34	−2.52
Saint Vincent, Minn	0.36	+0.13	0.40	+0.06	0.50	−0.21	1.36	+0.73	2.22	−0.69
Salt Lake City, Utah	1.39	+0.52	1.39	−0.03	2.11	+0.49	2.68	+1.75	2.01	−1.95
San Antonio, Tex	1.27	−0.52	1.99	+1.16	2.39	±0.0	3.05	−0.82	3.70	−1.09
San Diego, Cal	2.05	+4.90	2.36	−0.85	1.50	+2.23	0.94	+1.01	0.40	−0.36
Sandusky, Ohio	2.22	+0.06	2.91	−1.79	2.64	−0.26	2.50	−0.15	3.56	+0.13
Sandy Hook, N. J.[6]	4.33	+0.14	3.82	+2.71	5.02	+0.25	4.43	+0.63	4.32	+4.14
Sanford, Fla	2.54	+2.23	2.38	−1.20	3.80	+4.37	4.62	+1.98	2.48	−1.59
San Francisco, Cal	5.00	+2.42	3.64	−3.40	3.04	−0.97	2.39	+2.89	0.62	−0.25
Santa Fé, N. Mex	0.52	+0.18	0.65	+0.20	0.58	−0.11	0.68	+0.65	0.84	−0.63
Savannah, Ga	3.60	−0.68	3.09	−0.71	4.00	−0.84	4.38	−2.32	3.05	+1.32
Shaw, Fort, Mont.[7]	1.23	−0.38	0.61	+0.43	0.52	+0.03	0.92	+1.38	1.40	−0.77
Shreveport, La	5.19	−1.32	5.05	−0.28	4.89	+1.43	6.02	−0.88	4.78	−4.70
Sill, Fort, Ind. T	1.02	−0.60	1.63	−1.14	1.36	+0.10	2.36	−0.76	4.54	−4.47

[1] Station closed August 20, 1886.
[2] No record.
[3] Station closed December 31, 1886.
[4] Inappreciable.

at stations of the Signal Service, U. S. Army, for each month of the year—Continued.

June.		July.		August.		September.		October.		November.		December.	
Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.
4.77	+0.74	6.48	+1.09	6.51	+3.23	7.09	—2.98	6.52	—5.54	5.71	—4.15	6.37	—0.41
2.40	—1.26	1.21	—0.66	0.72	—0.69	1.66	+0.74	1.10	+0.47	0.58	—0.09	1.32	—0.34
4.14	—2.24	4.32	—2.72	3.37	+2.25	1.85	—0.26	1.86	—0.60	0.66	+0.52	0.39	+0.35
5.44	—0.52	5.31	—3.04	3.50	+3.20	2.73	+0.70	3.24	—2.04	3.66	+0.21	3.38	—1.18
2.59	+0.38	2.32	—0.93	3.88	(2)	7.01	(2)	3.71	(2)	3.07	(2)	3.08	(2)
5.69	—0.91	6.02	+8.95	7.02	—0.77	7.79	—2.88	5.99	—3.52	2.82	—1.85	3.29	—0.09
0.08	—0.08	0.14	±0.0	0.10	—0.02	0.0	±0.0	0.13	—0.12	0.36	—0.28	0.18	—0.18
5.43	—2.57	4.27	—3.62	3.26	+2.64	3.67	+0.28	3.49	—1.11	1.96	—0.81	2.15	—1.12
3.96	—1.45	4.23	+2.49	5.03	—0.49	6.55	+0.55	5.49	—2.17	2.25	—2.12	1.77	—0.94
5.00	+3.95	6.30	—3.61	7.48	—0.14	5.62	—3.70	4.07	—4.05	4.88	—3.49	5.24	—1.35
4.39	+0.23	4.66	+1.59	4.30	+0.87	2.81	—0.93	3.12	—2.25	4.49	+2.72	4.53	+0.81
4.54	—2.65	5.04	—3.27	3.67	+0.23	4.96	—1.75	2.52	—0.81	1.85	—0.53	1.28	—0.78
3.92	+0.81	4.97	—2.78	5.70	—1.33	9.60	—3.64	1.93	+0.36	1.08	+0.60	0.86	—0.04
2.25	—1.06	2.30	+2.36	1.93	—0.76	0.73	+0.50	0.55	—0.35	0.29	—0.06	0.69	—0.62
5.55	—0.62	4.80	—4.25	3.26	—2.53	3.50	—0.75	3.32	—1.52	2.36	—1.26	1.61	—0.96
4.15	+5.13	3.28	—0.31	3.80	+1.51	3.41	+2.83	2.85	—1.78	4.73	+1.08	4.45	—3.57
0.18	—0.07	0.03	+0.24	0.02	+0.19	0.16	—0.05	0.51	—0.49	1.44	—0.26	3.33	—3.07
4.46	+0.80	4.14	—1.04	3.57	+0.86	2.90	—1.27	3.32	—2.68	3.89	+1.83	4.30	—1.61
3.77	+4.71	3.15	+0.16	3.99	+0.30	3.22	—1.48	3.10	+2.09	3.38	+1.11	3.80	+0.99
2.47	—0.35	2.90	—1.72	2.82	+0.43	2.21	+1.63	2.95	+0.18	2.60	—1.27	3.24	—2.45
5.68	+0.84	6.96	+2.74	6.58	+0.50	6.32	—4.62	3.22	—2.62	2.66	—1.49	4.53	—0.86
2.28	+0.27	0.54	—0.20	0.81	—0.02	0.79	+0.38	1.20	+1.01	0.83	+0.84	0.72	—0.28
4.06	+0.27	3.13	1.80	3.14	+0.56	4.76	—2.82	3.67	—1.52	2.53	+1.22	2.12	+0.67
5.25	+2.81	3.13	+2.30	3.27	+3.22	3.25	+2.95	3.40	—2.81	4.71	+4.18	3.93	—0.93
4.12	—1.58	3.29	—2.35	3.11	+0.29	3.09	—0.71	2.75	—0.44	2.06	—0.44	1.89	+0.14
5.55	+0.39	6.23	+0.36	6.80	—3.25	5.14	—2.45	3.45	—3.32	4.48	—1.12	4.69	—2.72
5.02	+3.59	3.91	—0.54	3.54	+1.83	2.81	—1.72	2.41	—2.38	3.87	+2.85	5.26	—2.21
0.52	—0.51	0.71	—0.38	1.80	—0.42	0.80	+0.26	0.76	+0.19	0.52	+0.02	0.60	—0.10
4.47	—0.76	4.59	+0.81	3.42	—2.10	2.42	—1.11	2.77	—0.56	1.25	+1.17	0.78	—0.25
9.38	—3.29	10.63	—4.33	8.12	+0.22	8.66	—0.14	7.45	—2.36	6.62	—0.14	5.22	—2.12
4.39	+3.30	4.83	—2.93	3.40	+2.10	3.50	+0.18	2.86	—2.35	3.91	+1.82	3.64	—2.16
3.19	—0.35	4.75	—0.06	5.72	—1.16	3.58	—1.23	3.73	—1.78	3.95	—0.12	3.58	—0.11
3.39	—1.25	4.37	—0.55	5.33	—0.29	3.28	+0.41	4.29	—0.15	4.25	+0.32	3.60	+0.77
6.23	+3.07	6.43	—2.08	5.33	—2.93	4.86	—0.77	3.17	—2.95	5.28	+0.05	4.87	—2.30
3.26	—0.25	4.36	—1.79	4.84	—3.66	3.34	—1.55	3.36	+0.54	3.52	+1.09	3.21	+0.52
4.33	+1.01	5.29	—1.06	5.93	+4.30	4.76	—0.13	3.54	—2.23	3.36	—1.42	3.97	+1.88
3.51	—2.37	2.78	—2.10	2.48	—0.49	1.34	—0.12	1.26	—0.67	0.43	±0.0	0.74	—0.34
1.17	+0.09	0.89	+0.26	0.72	—0.30	3.08	+0.09	5.05	—0.90	7.04	—5.31	9.61	+3.77
6.15	—4.65	5.83	—5.14	3.53	—1.00	3.58	+0.87	3.04	—1.71	1.33	+0.21	1.03	+0.43
3.23	—2.20	3.44	+0.80	2.45	+0.13	2.66	+1.61	3.38	—1.26	3.25	+0.82	3.59	—1.26
2.85	—0.48	2.79	+0.52	1.89	—0.57	4.00	+3.12	3.86	—1.91	4.71	—3.29	2.93	—2.48
5.69	+1.98	6.19	+2.66	10.42	—1.60	5.78	—4.49	3.43	—3.23	5.11	—2.35	5.13	—1.00
3.34	—0.48	4.22	+0.01	4.88	—3.50	3.19	—1.99	2.83	—0.94	3.25	+0.66	2.64	+0.45
1.84	—0.60	4.29	—0.99	3.72	—0.54	1.77	—1.06	1.48	—0.17	1.80	—0.73	1.46	—0.29
3.61	+1.56	4.71	+0.85	3.29	—0.44	2.60	+0.26	2.56	—1.50	2.59	+2.32	2.86	—1.05
1.63	—0.83	1.63	—0.69	0.68	—0.17	0.56	—0.35	0.79	—0.39	0.40	+0.29	0.38	+0.29
1.04	—0.34	0.33	+0.13	0.94	—0.06	2.38	—0.70	2.85	—0.97	2.29	—0.83	4.67	+3.04
3.76	—2.74	2.86	—0.86	2.81	—0.08	2.62	+2.11	3.03	—1.72	2.68	—0.28	2.38	—0.62
3.40	—1.74	3.82	—0.19	3.57	+0.36	3.04	+2.52	3.80	+2.90	3.82	+1.51	3.25	+1.79
1.71	—1.04	0.72	—0.40	0.67	—0.64	1.82	—0.63	4.53	—1.66	6.79	—5.79	8.36	+3.16
0.15	—0.15	2.02	—1.41	3.20	+1.21	1.08	—0.62	0.55	—0.32	0.78	+0.90	1.72	—1.72
0.37	—0.37	0.01	—0.01	0.03	—0.03	0.63	—0.63	1.33	+0.43	3.50	—3.16	5.06	—1.14
1.28	+0.80	1.54	+0.01	3.71	—3.08	3.79	+4.42	2.12	—1.99	0.85	+0.60	1.13	—1.05
3.26	—0.93	3.27	—2.20	3.24	+4.02	2.37	+0.53	3.16	—0.86	2.86	+1.59	2.93	—1.04
0.97	—0.84	0.61	+1.59	0.31	—0.31	0.86	+0.53	2.83	+0.60	3.79	—1.16	6.43	+0.87
0.25	—0.25	(4)	—(4)	(4)	—(4)	0.27	—0.27	0.90	—0.22	2.09	—1.88	4.04	—1.83
5.12	+1.97	3.92	—3.37	2.50	—0.06	3.61	+5.99	2.93	2.08	2.67	+0.69	2.44	+0.21
1.40	+0.37	1.75	(2)	2.61	(2)	2.90	(2)	1.34	(2)	0.79	(7)	0.67	(2)
4.85	—1.22	3.26	—1.82	3.67	—1.40	3.38	+0.31	2.05	—1.33	1.37	+0.70	1.30	+0.18
2.59	—0.44	2.66	—0.39	2.68	—2.27	2.13	+1.07	2.28	—0.92	0.56	—0.01	0.52	—0.25
0.85	+0.17	0.55	—0.55	0.83	—0.21	0.96	+0.92	1.73	+0.25	1.62	+0.17	1.42	—0.15
2.15	+1.37	3.46	—2.05	3.47	+1.32	4.49	—0.37	2.24	—1.62	1.58	—1.25	1.79	—1.49
0.07	±0.0	0.02	—0.02	0.19	—0.19	0.04	—0.04	0.41	—0.39	0.73	+0.22	2.09	—1.99
4.56	—2.40	3.92	—1.66	4.00	—0.22	3.36	+0.47	2.98	—1.74	3.24	—0.30	2.80	+0.17
4.11	—0.11	4.42	+1.28	4.61	—1.86	4.10	—3.04	3.66	+3.04	4.27	+1.61	3.91	(2)
8.78	+2.30	6.11	+4.10	7.18	—3.06	5.75	—0.74	6.91	+1.81	0.72	+0.07	1.93	+1.27
0.30	—0.29	0.02	+0.21	0.01	—0.01	0.15	—0.14	1.22	+0.26	3.00	—2.16	4.75	—2.68
1.16	—0.21	3.09	—1.55	2.94	+1.21	1.51	+2.51	1.03	+0.03	0.87	—0.57	0.82	—0.50
7.02	+0.22	5.18	+1.84	8.07	—0.75	5.41	—3.80	3.77	—2.87	2.29	—1.78	3.53	—0.37
2.24	—0.60	1.55	—0.73	0.87	—0.68	1.46	—0.35	1.01	—0.07	0.58	(7)	0.81	(2)
3.45	+0.71	3.91	—1.33	2.04	+1.56	4.43	+0.55	3.71	—0.12	4.79	—1.19	5.09	—3.57
4.93	—3.85	2.81	—1.97	2.81	+0.59	2.72	—0.10	2.90	+1.20	1.77	—1.30	1.92	—1.90

[6] Station closed June 30, 1886.
Station closed November 30, 1886.

[7] Station closed October 31, 1886.

Normal precipitation (in inches and hundredths) and departure of 1886 therefrom,

Stations.	January.		February.		March.		April.		May.	
	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.
Sitka, Alaska	10.14	−2.78	11.62	+7.22	10.55	−0.47	6.18	+1.49	4.54	−0.86
Smithville, N. C.[1]	3.80	−1.66	2.87	−0.71	4.11	+1.35	3.30	−0.20	2.91	−1.45
Spokane Falls, Wash	2.82	+0.30	2.50	−1.89	1.03	+0.04	1.46	−0.28	1.19	−0.27
Springfield, Ill	2.07	+0.12	4.46	−2.60	2.77	−0.32	3.61	−0.63	5.14	−1.58
Stanton, Fort, N. Mex	0.76	−0.40	0.40	−0.23	0.61	−0.11	0.77	+0.73	1.18	(3)
Stockton, Fort, Tex.[3]	0.31	(2)	0.78	−0.56	1.24	−1.16	0.43	−0.25	1.38	−1.13
Sully, Fort, Dak	0.52	−0.34	0.28	−0.18	0.88	−0.22	1.88	+1.74	2.57	−1.71
Tatoosh Island, Wash	14.87	+1.95	9.87	+0.42	5.21	+5.68	3.57	+3.47	4.45	−1.00
Thomas Fort, Ariz	0.70	+1.46	1.34	+0.06	1.27	−0.83	0.26	−0.02	0.29	−0.29
Toledo, Ohio	2.20	+0.59	1.88	−0.56	2.16	+0.12	2.26	−0.18	3.40	+1.10
Totten, Fort, Dak	0.45	+0.46	0.54	+0.25	0.52	+0.20	2.10	−1.25	1.88	+0.87
Unalashka, Alaska[4]	13.81	+2.01	7.68	−0.04	6.48	−1.74	7.51	+6.58	4.49	−0.78
Valentine, Nebr	0.19	±0.0	0.35	±0.0	0.53	±0.0	1.39	±0.0	3.26	±0.0
Vicksburg, Miss	5.80	+2.04	5.21	−0.24	6.56	−0.49	7.26	+2.73	5.03	−3.51
Walla Walla, Wash	3.45	±0.0	1.29	±0.0	1.06	±0.0	1.66	±0.0	0.67	±0.0
Washington City	3.51	+1.50	3.30	+1.02	4.23	+2.18	2.89	−0.18	3.46	+7.14
Wilmington, N. C	4.02	−0.12	3.31	−1.16	4.38	+1.22	3.34	−0.08	4.22	−3.04
Winnemucca, Nev	1.07	−0.36	0.94	−0.50	0.80	+0.02	1.07	+0.30	0.83	−0.69
Yankton, Dak	0.56	−0.13	0.82	−0.25	1.29	+2.09	3.39	+1.73	4.45	−1.06
Yuma, Ariz	0.41	+0.65	0.53	−0.45	0.22	+0.11	0.11	+0.20	0.05	−0.05

[1] Changed to third order October 31, 1886.
[3] Station closed June 20, 1886.
[4] Station closed May 22, 1886.

at stations of the Signal Service, U. S. Army, for each month of the year—Continued.

June.		July.		August.		September.		October.		November.		December.	
Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.
3.34	+1.19	4.89	— 1.62	6.52	+4.20	12.83	+12.69	13.49	+11.33	13.68	+6.83	10.11	— 6.85
3.31	+0.37	6.43	+ 5.56	5.35	—1.99	5.97	— 5.45	5.06	— 3.90	2.94	—1.18	3.48	— 0.34
1.59	—1.02	0.82	— 0.45	0.30	+0.03	1.29	— 0.29	2.24	— 0.13	2.03	—1.32	2.52	+ 1.35
6.11	—2.28	2.23	— 2.18	3.04	+1.15	3.91	+ 3.33	4.12	— 3.32	3.03	—1.29	2.95	— 2.15
1.69	—0.08	3.45	+ 1.26	5.00	+0.45	2.95	+ 1.34	1.38	— 0.06	0.32	—0.17	0.62	— 0.54
2.08	—0.61	1.99	(2)	2.52	(2)	5.24	(2)	1.56	(2)	0.70	(2)	0.70	(2)
3.53	—0.29	2.50	— 0.06	1.96	—0.55	1.12	— 0.68	0.68	— 0.19	0.58	+1.02	0.51	+ 0.45
2.96	+0.17	2.81	+ 3.71	3.44	+1.26	7.10	— 1.56	7.16	+ 0.65	13.08	—2.64	14.72	+11.12
0.36	—0.36	1.60	— 1.50	2.64	+1.38	0.64	+ 0.54	0.42	+ 0.70	0.32	—0.16	1.30	— 1.26
3.62	—0.93	3.48	— 2.89	2.96	+0.17	2.67	+ 3.50	2.73	— 1.13	2.87	—0.10	2.53	+ 0.25
2.91	—0.12	3.39	— 2.10	2.23	—1.17	0.77	+ 0.10	0.91	+ 0.25	0.60	+0.05	0.44	— 0.06
4.26	(2)	2.78	(2)	3.40	(2)	8.64	(2)	11.98	(2)	9.30	(2)	11.81	(2)
2.25	±0.0	2.04	± 0.0	1.86	±0.0	1.70	— 0.52	0.60	— 0.33	0.44	+0.12	0.12	— 0.02
4.12	+5.51	4.13	— 2.55	3.20	—0.78	4.52	+ 0.61	3.19	— 2.55	5.54	—1.20	5.43	— 3.67
0.73	±0.0	0.02	± 0.0	0.12	±0.0	0.06	± 0.0	1.95	± 0.0	0.78	±0.0	3.16	+ 1.25
4.50	+2.25	4.63	+ 6.00	4.66	—2.23	3.85	— 2.06	3.16	— 1.96	2.91	—0.03	3.04	+ 0.40
6.38	+2.43	7.15	+13.97	7.69	—3.31	7.24	— 5.90	3.87	— 3.39	2.59	—2.40	3.69	+ 0.33
0.97	—0.21	0.18	+ 0.43	0.08	—0.08	0.30	— 0.30	0.70	+ 1.02	0.94	—0.14	1.18	— 0.35
4.81	—1.74	3.74	— 3.05	3.05	+2.35	2.93	+ 0.52	1.66	— 1.35	0.67	+1.77	0.72	+ 0.18
(5)	—(5)	0.17	∓ 0.17	0.49	+1.74	0.06	— 0.06	0.12	+ 0.99	0.18	+0.05	0.40	— 0.40

[2] No record. [5] Inappreciable.

Annual and mean annual precipitation (in inches and hundredths) at stations of the Signal Service, U. S. Army—Continued.

Stations.	Established.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	Mean annual.	
																		Years.	Mean.
		In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*
Mount Washington, N. H	Dec. 1, 1870		56.51	78.56	70.72	55.78	77.56	86.41	114.49	91.11	79.93	121.13	97.41	76.71	100.78	78.37	67.52	15	83.53
Nashville, Tenn	Nov. 1, 1870		40.20	51.69	58.24	53.48	46.91	49.64	48.56	57.69	67.24	48.08	63.45	58.33	54.02	42.95	44.74	15	52.35
New Haven, Conn	Dec. 10, 1872			57.32	55.82	43.52	53.98	51.36	58.12	55.50	46.52	51.32	47.92	39.46	49.33	38.32	42.32	14	49.34
New London, Conn	Jan. 10, 1871	42.50	47.01	42.26	59.59	44.79	43.20	51.31	39.35	51.05	43.23	51.64	50.46	54.37	61.33	49.07	58.86	16	49.38
New Orleans, La	Nov. 1, 1870	64.62	60.68	65.55	62.74	85.73	67.25	63.09	66.16	51.27	69.83	64.01	50.18	69.85	60.01	64.18	54.83	16	63.75
New York city	Nov. 1, 1870	48.80	45.79	39.98	40.84	45.09	47.40	40.94	46.67	36.13	37.34	40.40	46.61	38.83	55.34	42.12	46.73	16	43.69
Norfolk, Va	Jan. 1, 1871	56.65	56.95	55.43	50.41	50.97	46.54	69.13	51.87	35.88	51.84	40.06	57.67	54.30	45.05	43.25	54.83	16	51.27
North Platte, Nebr	Sept. 15, 1874					15.35	11.84	25.47	18.62	20.06	17.48	22.93	17.95	30.01	13.53	22.03	13.10	12	19.03
Olympia, Wash	July 1, 1877								63.34	73.44	62.77	65.56	51.59	41.61	35.58	41.95	48.13	9	53.77
Omaha, Nebr	Nov. 1, 1870	32.79	32.48	27.04	25.75	42.89	32.51	40.95	37.05	30.81	28.52	45.74	37.68	48.92	47.68	36.68	22.67	16	35.60
Oswego, N. Y	Nov. 1, 1870	29.20	27.61	33.29	34.93	31.41	34.20	32.20	55.83	36.60	43.19	39.25	36.13	34.49	31.47	33.14	35.46	16	35.52
Palestine, Tex	Dec. 3, 1881													43.49	51.64	(1)	33.21	3	42.78
Pensacola, Fla	Oct. 27, 1879										61.30	66.02	72.01	61.55	61.90	64.57	62.15	7	67.07
Philadelphia, Pa	Jan. 1, 1871		48.36	55.28	46.25	40.22	47.39	37.26	34.53	36.75	33.58	30.21	45.58	39.17	39.84	33.35	39.24	15	40.43
Pike's Peak, Col	Nov. 1, 1873				26.86	24.74	23.87	25.58	42.87	39.82	40.65	44.57	28.82	18.17	9.28	30.48	29.51	13	29.63
Pittsburg, Pa	Nov. 1, 1870		31.05	41.42	39.42	34.05	37.01	34.72	38.76	37.02	31.97	37.30	38.63	43.17	34.82	34.12	39.21	15	36.84
Poplar River, Mont	May 1, 1882													6.22	10.25	11.93	7.41	4	8.95
Port Angeles, Wash	Feb. 1, 1885														27.04	28.03	29.96	3	28.34
Port Huron, Mich	July 25, 1874					29.14	37.16	31.61	39.91	27.54	38.68	35.27	41.04	36.98	29.19	33.81	29.84	12	34.18
Portland, Me	Jan. 15, 1871		37.02	36.90	36.24	36.14	39.04	43.51	38.60	41.61	37.59	46.68	38.74	31.99	52.51	39.95	51.63	15	40.54
Portland, Oregon	Nov. 1, 1871		46.90	50.52	46.17	60.08	55.04	58.30	47.70	62.22	51.87	58.05	67.24	51.45	38.41	39.50	38.76	15	51.49
Prescott, Ariz	Nov. 19, 1873						16.16	(1)	15.63	12.89	10.02	15.45	15.26	16.13	26.75	10.11	18.78	10	15.72
Red Bluff, Cal	July 1, 1877								48.96	33.64	26.53	24.93	21.82	13.76	28.06	29.63	17.21	9	27.17
Rio Grande City, Tex	May 28, 1875							15.83	24.43	25.61	22.31	28.13	(1)	(1)	18.84	26.52	20.11	8	22.72
Rochester, N. Y	Nov. 1, 1870	36.34	36.29	49.89	35.62	29.93	35.82	34.12	48.81	35.22	41.80	38.24	24.73	(1)	31.17	28.31	36.84	15	36.21
Roseburg, Oregon	July 15, 1877								36.92	45.03	31.44	43.68	34.77	22.48	(1)	30.91	35.17	8	35.05
Sacramento, Cal	July 1, 1877								23.45	22.87	31.99	20.71	18.06	13.48	34.92	20.72	18.17	9	22.65
Saint Louis, Mo	Nov. 1, 1870	22.61	30.40	45.03	37.88	42.99	47.74	41.26	40.83	25.70	34.56	37.37	43.15	40.10	40.64	45.59	44.34	16	38.76
St. Michael's Fort, Alaska[2]	June 27, 1874							9.37	16.18	7.26	(1)	16.61	8.20	21.73	15.50	20.93	(1)	8	14.47
Saint Paul, Minn	Nov. 1, 1870	30.68	(1)	34.75	35.51	30.66	23.67	28.80	22.78	32.39	29.76	39.16	23.14	26.70	26.11	25.32	22.89	15	28.82
Saint Vincent, Minn	Sept. 5, 1880											15.51	22.48	17.88	21.81	16.58	15.04	6	18.22
Salt Lake City, Utah	Mar. 19, 1874					23.64	21.28	16.85	19.75	13.11	10.94	16.88	15.98	14.24	17.52	19.69	18.89	12	17.86
San Antonio, Tex	Sept. 22, 1875							30.29	39.60	22.80	41.91	26.78	36.39	(1)	(3)	(1)	26.22	7	32.00
San Diego, Cal	Nov. 1, 1871		6.04	13.01	10.91	6.80	7.24	8.12	13.87	14.71	10.37	5.00	9.74	8.01	27.59	[illegible]	15.35	15	10.83
Sandusky, Ohio	Aug. 2, 1877								42.91	37.71	39.44	46.31	42.53	(1)	33.64	34.23	31.00	8	38.47
Sandy Hook, N. J.[4]	Dec. 10, 1873				51.20	48.31	57.26	53.65	61.70	56.50	41.06	46.74	52.14	44.09	53.73	38.42	(1)	12	50.40
Sanford, Fla	Sept. 1, 1882													44.61	46.81	56.58	64.77	4	53.19
San Francisco, Cal	Mar. 8, 1871		22.45	18.55	22.52	22.63	23.54	11.93	33.26	30.76	30.07	23.73	18.67	15.43	38.82	24.90	20.02	15	23.82
Santa Fé, N. Mex	Nov. 20, 1871		9.87	9.73	19.93	18.97	15.07	13.15	19.52	11.44	9.89	(1)	11.87	(1)	(1)	14.89	15.90	12	14.14
Savannah, Ga	Jan. 1, 1871	61.66	63.87	48.39	57.43	49.00	64.85	59.60	52.58	45.81	50.26	38.00	47.35	48.43	50.47	73.94	42.68	16	53.40
Shaw, Fort, Mont.[5]	Apr. 1, 1880											14.77	14.21	12.04	13.64	12.56	(1)	5	13.56

Shreveport, La	Sept. 3, 1871		51.03	52.37	54.80	50.98	54.49	47.71	55.83	41.59	66.60	53.72	65.11	43.11	66.08	58.60	44.21	15	53.75
Sill, Fort, Ind. T.	June 23, 1875							48.45	33.69	25.07	33.75	28.22	31.13	(1)	(1)	33.05	19.57	8	31.62
Sitka, Alaska	Mar. 30, 1881												102.24	102.37	110.94	102.79	140.26	5	111.72
Smithville, N. C.[6]	Oct. 15, 1875						56.23	65.01	56.88	49.03	50.13	50.64	48.27	46.67	36.00	48.07	38.93	11	49.63
Spokane Falls, Wash	Feb. 5, 1881												25.99	14.37	20.56	19.01	15.86	5	19.16
Springfield, Ill	July 1, 1879										30.93	56.51	58.21	48.79	43.18	38.61	31.69	7	43.99
Stanton Fort, N. Mex	Jan. 1, 1885														23.50	12.57	(1)	2	18.04
Stockton, Fort, Tex.[7]	Feb. 26, 1876								12.47	5.12	33.40	12.65	25.56	27.39	24.07	(1)	(1)	7	20.09
Sully, Fort, Dak	May 1, 1872			14.62	16.24	13.99	(1)	(1)	(3)	(3)	(3)	(1)	(1)	(1)	(1)	20.82	16.00	5	16.33
Tatoosh Island, Wash	Oct. 1, 1883														75.18	84.48	112.47	3	90.71
Thomas, Fort, Ariz	Sept. 22, 1877											11.41	8.66	10.85	18.16	8.70	10.86	6	11.44
Toledo, Ohio	Nov. 1, 1870	31.42	27.56	35.52	25.83	28.03	34.55	35.17	32.67	30.27	35.72	45.91	33.03	34.24	28.43	33.19	32.70	16	32.76
Totten, Fort, Dak	Oct. 8, 1883														17.36	18.69	14.22	3	16.76
Unalashka, Alaska[8]	Aug. 18, 1878												80.80	90.12	158.29	108.17	(1)	4	109.34
Valentine, Nebr	Jan. 27, 1885																13.98	1	13.98
Vicksburg, Miss	Sept. 10, 1871		58.27	41.45	66.10	70.05	51.79	52.96	60.86	52.31	84.19	51.94	71.56	63.75	72.70	54.28	55.89	15	60.54
Walla Walla, Wash	Dec. 1, 1885																16.20	1	16.20
Washington City	Nov. 1, 1870	37.98	30.86	45.70	34.58	41.11	47.96	52.59	60.09	32.83	38.83	42.20	46.79	45.71	49.96	44.84	58.17	16	44.39
Wilmington, N. C	Jan. 1, 1871	51.37	59.18	58.37	52.42	49.59	66.73	83.65	54.73	51.14	51.91	51.02	52.29	64.00	62.70	60.42	56.43	16	57.87
Winnemucca, Nev	July 1, 1877								6.77	9.86	(1)	11.91	10.46	(1)	(1)	11.80	8.16	6	9.74
Yankton, Dak	Apr. 1, 1873				23.93	37.15	28.84	28.31	28.73	22.78	21.68	40.95	20.63	35.21	22.16	30.18	29.15	13	28.43
Yuma, Ariz	Nov. 18, 1873						0.94	3.66	2.88	3.29	0.74	0.98	1.78	(1)	5.86	2.72	5.35	10	2.82

[1] Record incomplete.
[2] Station closed June 30, 1886.
[3] No record.
[4] Station closed November 30, 1886.
[5] Station closed October 27, 1886.
[6] Station closed October 31, 1886.
[7] Station closed June 20, 1886.
[8] Station closed May 22, 1886.

APPENDIX No. 28.

Monthly and annual precipitation (in inches and hundredths), from reports made by voluntary observers of the Signal Service, U. S. Army, for the year ending December 31, 1886.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Accotink, Va	4.29	4.95	6.65	1.99	8.72	5.93	8.34	2.28	1.94	0.99	2.85	2.76	51.69
Aiken, S. C	3.40	2.20	5.75	3.10	([1])	([1])	8.40	5.60	([1])	1.55	1.83	3.26	......
Albany, Oregon	9.92	3.34	3.19	2.95	1.79	0.36	0.99	([2])	1.20	3.28	1.75	10.31	39.08
Allison, Kans	2.50	0.65	1.62	4.84	1.96	6.39	4.72	1.13	1.18	0.12	1.05	([2])	26.16
Altoona, Pa	4.33	0.87	2.20	3.16	2.59	3.34	2.35	3.53	2.45	0.74	4.31	0.99	30.86
Alva, Fla	......	......	......	......	......	......	18.58	9.55	8.90	3.55	1.08	4.45	......
Amherst, Mass	4.55	4.36	3.50	2.06	3.32	1.80	2.89	2.92	5.48	3.06	4.72	3.12	41.78
Amherst (Agrl. Sta.), Mass	([1])	3.94	3.31	1.73	3.10	2.33	3.82	2.60	5.48	2.97	5.25	3.61	......
Anderson, Cal	([1])	0.38	1.08	5.42	2.15	0.03	0.00	0.00	0.00	2.83	0.50	6.57	......
Anna, Ill	3.18	2.38	4.05	3.45	3.71	3.84	1.16	2.63	4.33	0.74	6.65	3.25	39.37
Antrim, N. H	([1])	([1])	([1])	1.70	3.60	2.05	4.30	2.15	3.40	3.60	6.15	4.35	......
Archer, Fla	3.24	1.57	12.33	4.19	1.83	12.55	14.49	5.50	3.05	2.11	1.08	3.52	65.46
Ashland, N. H	4.84	5.27	3.14	1.43	3.76	2.77	2.09	3.54	4.09	3.53	6.11	4.40	44.97
Ashwood, Tenn	4.30	2.89	4.46	2.86	3.48	5.20	0.97	2.90	3.08	0.32	0.87	3.41	34.83
Atchison, Kans	1.54	([1])	0.95	2.22	1.72	3.05	0.12	1.76	3.07	([1])	([1])	([1])	......
Athens, Ga	6.47	2.51	9.74	4.59	6.84	9.08	1.97	2.78	0.96	0.01	3.61	4.39	52.95
Auburn, N. Y	3.82	3.03	3.78	3.69	2.92	3.53	7.83	2.49	4.29	2.85	6.89	2.95	48.07
Austin, Tenn	2.66	4.79	([1])	2.97	2.54	7.37	4.73	6.08	([1])	0.38	6.36	2.11	......
Austin, Tex	0.97	2.18	3.94	5.04	([2])	0.92	3.24	6.01	12.33	0.25	0.64	0.19	35.72
Bainbridge Island, Wash	6.95	1.96	2.78	2.37	1.76	0.41	1.23	0.35	1.21	3.00	1.80	11.15	34.97
Bancroft, Iowa	1.40	0.24	1.83	3.01	3.54	1.32	1.09	1.66	5.03	0.48	1.90	1.32	22.82
Bandon, Oregon	13.72	5.66	5.81	4.65	1.00	0.51	1.89	0.19	0.49	5.87	2.27	11.97	54.03
Bar Harbor, Me	9.29	5.89	3.28	1.07	3.90	1.75	1.51	1.44	2.58	2.58	5.74	3.30	42.33
Belleville, Kans	......	......	......	......	......	1.68	0.92	1.64	4.16	1.83	0.88	([1])	......
Belmont, N. H	4.78	4.61	3.41	1.41	2.81	2.67	4.04	2.87	2.73	2.53	4.87	4.50	41.23
Berlin Mills, N. H	([1])	2.60	([1])	1.20	1.65	1.38	1.30	3.57	2.71	1.62	([1])	2.99	......
Bethel, Conn	4.72	5.74	3.55	2.02	3.23	2.51	2.20	2.75	1.83	2.32	4.41	3.30	38.58
Bethlehem, Pa	([1])	4.68	4.08	2.98	5.59	4.53	3.52	2.15	1.77	2.18	5.44	3.66	......
Beverly, N. J	4.20	4.58	3.64	5.48	8.08	3.83	5.55	2.15	1.29	2.86	4.04	3.35	49.05
Birdsnest, Va	3.15	5.00	2.85	2.05	7.70	6.40	5.05	6.20	1.80	2.05	2.75	5.25	50.25
Birmingham, Ala	7.07	2.59	11.51	5.19	3.22	7.08	5.95	......	......	......	......	......	......
Birmingham, Mich	2.40	1.36	2.50	1.96	2.97	1.82	([1])	([1])	([1])	([1])	([1])	2.03	......
Blooming Grove, Pa	3.90	3.20	5.30	3.60	5.10	3.20	4.10	5.20	3.80	2.90	7.00	2.40	49.70
Bloomington, Ill	2.00	1.43	1.81	1.87	2.49	3.71	([1])	1.73	4.35	0.78	([1])	([1])	......
Blue Hill, Mass	5.17	8.29	3.05	2.16	3.94	1.52	([1])	3.95	3.08	4.87	3.16	5.54	......
Blue Lake, Cal	1.65	6.25	6.51	12.97	2.83	0.00	1.17	0.00	0.00	4.72	3.93	18.95	53.98
Brattleborough, Vt	6.47	3.14	2.98	3.29	3.71	2.25	([1])	3.29	4.25	4.14	5.67	([1])	......
Bristol, N. H	6.61	4.41	3.16	1.61	3.52	2.70	2.99	3.22	3.95	3.28	6.38	4.05	45.88
Bruington, Va	5.23	3.70	4.46	2.50	8.64	7.28	6.08	3.55	4.90	1.83	4.07	2.05	54.29
Brownsville, Nebr	([1])	0.25	2.02	([1])	([1])	([1])	3.00	2.12	6.36	4.37	2.00	1.00	......
Buckfield, Me	6.48	5.22	1.38	1.12	4.46	1.71	......	......	......	......	......	......	......
Burlington, Vt	1.68	1.06	1.33	1.68	2.61	1.98	3.94	3.22	3.73	1.25	4.29	2.20	28.97
Butlerville, Ind	......	......	......	......	......	8.51	2.62	6.00	1.71	1.08	4.99	3.22	......
Cahuenga Valley, Cal	7.65	1.21	2.61	3.00	0.00	0.00	0.10	0.16	0.00	0.05	0.72	0.20	15.70
Carson City, Nev	5.57	0.28	1.60	0.25	0.26	0.05	1.25	0.00	0.30	0.21	0.44	0.72	10.93
Carthage, Mo	([1])	([1])	1.65	1.54	1.12	5.60	10.28	3.82	([1])	([1])	([1])	0.90	......
Cattawissa, Pa	4.50	2.75	4.13	2.37	7.19	3.08	3.62	1.59	4.20	2.84	5.82	2.36	44.45
Cedar Rapids, Iowa	2.48	0.27	4.47	2.16	2.69	1.25	0.58	1.70	2.86	4.92	1.50	([1])	......
Central College (Fayette), Mo	([1])	0.90	2.35	3.57	3.12	5.40	0.76	3.06	6.11	1.99	1.85	0.79	......
Centralville, Mo	2.10	2.11	3.87	4.26	2.89	([1])	0.05	5.22	4.73	0.96	5.83	2.42	......
Chapel Hill, N. C	([1])	([1])	4.97	5.99	4.00	6.22	7.48	9.91	2.86	1.47	2.79	4.13	......
Charleston, Ill	2.80	1.04	3.32	2.73	3.56	2.69	3.66	2.90	4.02	0.74	3.86	1.92	33.24
Charlotte, Vt	2.90	2.00	2.40	2.90	3.50	5.40	2.80	3.00	4.20	1.50	5.80	2.20	38.60
Clarksburgh, W. Va	2.11	1.29	3.06	2.17	4.52	4.20	3.39	1.59	2.41	0.80	0.93	1.23	27.70
Clayton, N. J	5.01	8.00	2.59	2.66	4.44	2.32	2.10	2.96	1.40	2.32	5.03	3.86	42.69
Cleburne, Tex	1.81	1.75	3.31	2.58	0.00	2.18	1.38	2.09	4.20	0.37	1.07	0.05	20.79
Cleveland, Ohio	3.17	1.77	2.41	2.49	1.97	1.22	3.91	2.00	4.26	0.74	4.59	4.00	33.03
Clinton, Iowa	3.15	1.91	4.45	1.93	4.23	1.27	0.76	1.82	3.89	4.29	1.00	1.04	29.74
Cockburne Harbor, B. W. I	1.45	2.63	([1])	5.65	2.66	1.84	1.04	1.30	([1])	3.96	([1])	0.95	......
College Hill, Ohio	4.59	2.00	1.25	3.62	8.25	7.75	5.00	5.12	2.00	1.25	4.50	2.62	47.95
Collinsville, Ill	3.49	1.59	2.77	1.71	3.72	6.55	0.04	3.45	5.12	0.78	2.74	1.88	33.84
Colorado Springs, Colo	([1])	0.30	0.39	4.82	0.12	3.06	2.91	1.39	0.33	0.28	0.19	0.16	......

[1] No record. [2] Inappreciable.

Monthly and annual precipitation (in inches and hundredths), from reports made by voluntary observers of the Signal Service, U. S. Army, etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Comfort, Tex	0.56	(1)	3.56	1.77	1.46	1.88	4.64	3.44	3.10	1.75	0.16	0.20	......
Conception, Mo	2.51	0.75	(1)	2.70	4.73	2.12	0.68	1.57	5.05	(1)	1.39	0.70	......
Cooperstown, N. Y	1.83	1.86	2.92	1.86	2.50	3.01	3.02	2.56	4.12	2.54	4.72	2.00	32.94
Cornish, Me	7.18	6.00	2.85	3.08	3.71	2.19	3.10	4.08	4.95	5.10	4.78	1.96	48.98
Corsicana, Tex	3.18	2.51	4.22	3.95	0.00	3.94	3.51	1.15	5.41	2.53	2.59	0.24	33.23
Cresco, Iowa	3.72	0.95	2.04	2.37	2.03	(1)	(1)	(1)	(1)	1.72	1.86	0.80	......
Crete, Nebr	1.63	0.92	2.39	4.20	3.39	6.10	0.83	3.24	3.21	0.71	0.50	0.57	27.69
Cumberland, Md	2.90	1.83	3.53	2.18	3.62	4.02	2.87	3.25	1.38	0.50	4.15	1.17	31.40
Dale Enterprise, Va	5.96	3.59	6.86	3.90	12.66	8.63	6.13	5.85	1.58	2.54	6.46	4.15	68.31
Deerfield, Mass	5.86	3.24	3.28	3.62	3.36	(1)	4.45	(1)	5.08	3.72	5.65	2.98	......
Delavan, Wis	.....	.....	.....	.....	....	0.95	0.70	7.40	2.79	2.70	1.19	1.36	......
De Soto, Nebr	2.24	0.41	3.16	2.23	2.16	1.62	0.70	2.71	3.53	2.74	1.70	1.58	24.78
Distributing Reservoir, D. C	5.18	3.72	4.72	5.43	9.75	7.11	8.40	1.58	2.07	1.19	4.31	2.77	56.23
Dover, N. J	5.59	5.02	3.23	3.39	6.07	2.54	3.16	3.38	1.07	2.02	4.47	2.87	42.81
Drifton, Pa	6.42	3.47	5.15	4.11	8.00	2.60	4.35	1.82	(1)	3.64	6.52	2.64	......
Dudley, Mass	3.15	5.12	2.82	1.64	2.77	1.29	4.81	3.04	2.20	1.73	3.66	4.06	36.29
Dyberry, Pa	2.85	2.43	3.51	1.89	4.41	1.21	2.84	1.98	5.06	2.42	7.10	2.32	38.02
Easton, Pa	3.08	5.28	4.11	3.37	7.14	3.93	4.65	2.63	1.33	2.37	5.80	3.86	47.55
East Portland, Oregon	5.08	2.00	3.01	3.04	1.08	0.04	0.06	0.00	0.04	8.12	1.00	11.34	29.84
Egg Harbor City, N. J	(1)	(1)	4.50	9.20	1.57	5.79	7.95	5.36	1.25	3.15	(1)	(1)	......
El Dorado, Kans	(1)	(1)	(1)	(1)	1.50	3.70	4.05	(1)	(1)	2.13	0.51	0.19	......
Elk Falls, Kans	3.00	1.56	1.46	1.73	0.40	3.59	3.72	4.25	5.45	1.62	0.66	0.20	27.64
Elyria, Ohio	(1)	(1)	(1)	(1)	1.63	2.64	3.33	2.25	3.56	1.31	4.31	3.58	......
Embarrass, Wis	4.35	2.25	3.95	2.55	2.05	4.50	2.35	7.00	5.20	5.85	3.65	1.70	45.40
Emporia, Kans	1.03	(2)	2.25	2.48	2.60	3.25	1.82	2.49	0.90	1.70	0.98	0.56	20.06
Eola, Oregon	9.46	1.94	3.67	2.74	1.56	0.58	0.24	0.00	1.08	3.12	1.45	9.08	34.92
Factoryville, N. Y	3.42	0.94	1.98	2.68	1.42	1.87	5.43	1.47	3.01	1.85	4.77	0.77	29.61
Fairbury, Nebr	(1)	0.98	2.56	3.88	4.66	3.97	0.49	3.49	5.15	1.93	(1)	(1)	......
Fall Brook, Cal	9.70	1.13	4.70	3.43	0.00	0.14	(1)	(1)	(1)	0.04	1.95	0.30	......
Fall River, Mass	6.74	11.17	3.85	2.10	4.26	1.38	2.17	4.18	2.23	4.59	4.90	5.25	52.82
Fallsington, Pa	4.12	5.67	3.53	4.09	6.49	2.90	4.54	(1)	0.85	2.90	4.72	3.50	......
Fallston, Md	6.00	5.96	6.03	2.53	8.26	5.25	10.03	4.53	1.63	2.24	4.19	4.22	60.89
Flat Rock, N. C	(1)	1.17	8.64	5.21	9.47	(1)	(1)	(1)	(1)	0.17	8.51	5.20	......
Fond du Lac, Wis	(1)	(1)	3.43	1.56	1.09	1.56	1.20	3.77	3.59	1.97	1.61	1.31	......
Forsyth, Ga	8.15	2.26	8.67	1.88	4.05	11.14	4.26	3.49	0.10	0.35	4.55	3.18	52.08
Fort Madison, Iowa	2.50	0.90	(1)	1.40	4.80	0.85	0.30	6.60	3.45	3.40	(1)	(1)	......
Fort Meade, Fla	(1)	0.25	5.25	4.10	2.20	6.80	(1)	10.50	5.40	2.54	0.40	2.30	......
Fort Wayne, Ind	2.50	0.87	4.01	2.82	2.96	6.00	2.45	4.41	9.25	1.20	3.63	1.94	42.06
Fostoria, Ohio	3.03	1.05	1.98	1.50	3.07	3.08	.....	.....	.....	.....	.....	.....	......
Frankfort, Ky	3.67	3.18	4.44	5.44	4.03	5.01	2.51	4.35	2.90	0.89	6.18	3.52	46.12
Franklin, Pa	4.86	3.32	3.40	4.24	1.03	4.33	3.96	1.62	3.20	1.20	4.49	3.36	39.01
Fremont, Nebr	.....	.....	.....	.....	....	.....	1.07	2.77	3.39	0.95	1.92	1.63	......
Gallinas Springs, N. Mex	1.05	1.50	1.00	1.75	1.31	5.04	2.57	5.12	7.78	1.26	(1)	0.25	......
Gardiner, Me	6.61	7.25	3.90	1.43	3.76	1.84	1.94	2.82	3.68	3.67	6.06	4.68	47.64
Garrettsville, Ohio	4.45	1.35	2.69	2.12	2.22	2.35	1.89	2.74	2.19	0.87	4.94	2.82	30.63
Geneseo, Ill	2.81	1.98	3.17	2.17	3.98	0.54	0.40	0.83	2.99	2.36	0.76	0.84	22.83
Genoa, Nebr	2.13	0.39	0.82	2.21	4.85	3.24	3.22	3.20	3.43	1.43	1.43	1.22	27.57
Germantown, Pa	5.89	6.97	2.67	(1)	5.36	(1)	5.21	1.86	0.81	2.71	4.05	5.34	......
Grampian Hills, Pa	4.27	1.90	3.62	3.44	3.87	4.93	5.47	2.92	4.50	0.97	6.03	2.94	44.86
Grand Coteau, La	7.31	1.37	5.92	8.04	1.50	11.31	8.08	1.62	5.91	2.73	2.94	3.26	59.99
Grand Turk Island, B. W. I	2.28	2.75	0.81	2.52	1.92	1.73	0.37	1.78	(1)	4.61	(1)	3.20	......
Great Falls Reservoir, Md	3.46	2.79	4.16	4.21	7.77	4.98	8.42	1.03	1.04	2.31	3.69	3.07	46.93
Greensborough, Ala	10.15	5.34	11.72	6.97	2.86	6.73	(1)	7.31	0.54	1.50	4.53	2.11	......
Harrisville, Mich	4.66	2.15	(1)	3.22	1.20	5.01	2.07	4.33	3.09	1.57	2.34	(1)	......
Hartford, Conn	4.60	6.16	4.17	3.35	3.42	1.97	4.90	3.33	3.08	2.49	6.32	4.31	48.10
Hay Springs, Nebr	0.55	0.93	1.51	1.83	1.80	2.66	3.09	2.32	0.37	0.37	2.19	0.60	18.22
Helvetia, W. Va	3.45	2.71	4.46	3.44	7.08	5.46	4.82	3.77	4.37	1.35	4.53	4.57	50.01
Hiram, Ohio	4.34	1.56	1.71	1.52	2.58	2.58	2.38	(1)	2.80	1.28	5.68	2.84	......
Hudson, Mich	1.25	0.18	0.75	1.19	4.03	3.48	1.13	4.60	6.21	1.67	2.15	2.65	29.29
Humphrey, N. Y	2.35	1.70	2.57	2.28	3.35	2.76	4.96	2.57	3.91	1.55	6.23	2.67	36.90
Hydesville, Cal	8.73	3.56	3.13	9.15	1.28	0.00	0.36	0.00	0.00	3.06	1.95	7.23	38.45
Independence, Iowa	3.69	0.80	1.98	1.78	5.00	1.69	0.90	1.12	4.98	3.60	0.96	0.84	27.34
Independence, Kans	1.58	1.48	1.68	4.98	1.11	2.23	3.60	4.25	5.27	1.02	1.70	(1)	......
Ithaca, N. Y	3.69	0.62	2.50	1.97	1.79	2.28	4.55	1.69	3.96	2.28	6.03	1.61	32.92
Jacksonborough, Ohio	3.20	1.51	2.35	5.30	6.40	6.25	3.45	4.60	4.45	1.55	4.55	3.05	46.66
Jeffersonville, Ind	3.69	2.16	2.83	2.83	3.71	5.14	1.48	5.16	1.41	0.62	5.85	2.52	37.40
Kalamazoo, Mich	3.80	1.64	1.64	1.13	3.64	2.98	2.16	4.67	5.63	1.29	1.36	2.02	31.96
Kennewick, Wash	2.10	0.19	0.27	0.20	0.05	0.30	0.07	(2)	0.09	1.17	0.04	2.28	6.76
Kendall Green, D. C	2.40	2.51	4.04	5.38	9.20	(1)	(1)	(1)	(1)	0.88	2.44	2.44	......
Kent's Hill, Me	7.52	6.60	3.12	1.70	4.00	2.29	2.18	3.50	(1)	3.24	4.35	6.14	......
Kew, B. W. I	1.20	0.58	(1)	6.32	2.69	5.24	0.97	3.72	(1)	7.16	(1)	5.97	......
Kirkwood, S. C	2.61	1.59	3.40	2.01	5.66	7.07	4.78	2.38	2.19	0.39	0.92	2.19	35.19
Laconia, Ind	3.87	2.73	2.68	3.99	4.49	5.36	1.62	3.35	(1)	0.53	5.42	2.17	......
Lafayette, Ind	1.75	1.32	2.04	1.80	7.08	2.60	2.14	4.46	4.39	0.73	1.87	1.96	32.14
La Grande, Oregon	(1)	(1)	(1)	(1)	(1)	0.52	0.18	0.10	0.40	1.49	(1)	4.64	......

1 No rocord.

2 Inappreciable.

Monthly and annual precipitation (in inches and hundredths), from reports made by voluntary observers of the Signal Service, U. S. Army, etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
La Grange, Ind	3.90	1.06	2.27	2.13	4.50	4.56	2.50	5.70	(1)	2.07	2.00	(1)	......
Lake Village, N. H	4.23	4.72	3.68	2.19	2.94	2.33	4.90	3.56	3.76	3.02	5.22	4.75	45.30
Lansing, Mich	2.27	1.64	2.83	1.51	3.00	2.14	0.64	5.70	6.05	1.15	1.37	1.22	29.52
Lawrence, Kans	(1)	0.56	1.63	(1)	5.72	3.71	0.11	2.49	2.34	(1)	(1)	0.83	......
Lead Hill, Ark	2.45	2.61	4.87	5.44	2.04	5.42	5.91	3.91	8.44	0.10	3.49	1.51	46.09
Lenoir, N. C	6.50	0.18	3.40	3.50	6.20	8.00	9.10	10.20	2.70	1.00	5.90	(1)	......
Leroy, N. Y	1.98	2.02	2.24	4.22	3.62	2.81	(1)	(1)	3.34	1.74	5.32	0.88	......
Liberty Hill, La	4.52	4.82	5.17	3.77	0.25	6.26	4.62	4.31	5.42	2.17	3.01	2.11	46.43
Limona, Fla	2.94	0.94	5.78	3.28	1.09	11.68	17.32	8.91	6.67	2.64	1.02	1.90	64.67
Lincolnton, N. C	6.19	1.90	5.89	5.14	11.96	8.43	8.54	5.35	1.18	0.21	4.37	1.89	61.05
Logan, Iowa	2.60	0.30	2.50	2.10	1.80	3.30	2.20	2.20	(1)	3.80	2.30	(1)	......
Logansport, Ind	2.26	(1)	(1)	2.20	5.20	4.45	2.80	6.30	5.90	1.30	3.71	2.83	......
Luling, La	6.71	3.29	6.94	6.41	2.64	4.11	4.41	1.09	3.83	0.70	(1)	(1)	......
Lunenburg, Vt	2.65	1.67	0.90	0.75	2.37	1.70	2.32	4.70	3.98	1.40	3.90	3.40	29.74
Madison, Wis	3.33	2.35	4.67	2.48	2.02	1.08	0.79	5.05	2.29	3.21	1.21	1.05	29.51
Mahanoy Plane, Pa	8.46	5.59	7.59	2.36	8.34	5.23	5.58	1.63	2.23	3.35	(1)	(1)	......
Manatee, Fla	2.56	0.55	5.20	0.59	0.17	11.14	14.06	11.43	4.22	3.90	0.92	1.78	56.52
Manchester, Iowa	2.57	1.09	2.09	2.01	(1)	1.54	0.54	0.70	6.76	8.15	(1)	(1)	......
Manhattan, Kans	0.96	0.39	2.21	4.84	5.25	5.40	2.88	2.01	1.18	2.25	1.30	1.39	29.56
Manitowoc, Wis	3.80	0.80	3.62	2.00	1.39	3.88	1.73	1.37	6.68	3.86	2.47	1.45	33.05
Marietta, Cal	10.66	0.48	5.94	3.79	(3)	0.00	(3)	0.00	(1)	(1)	(1)	(1)	......
Marion, Va	3.58	1.57	3.48	3.40	4.57	7.80	4.44	6.09	1.10	0.63	(1)	(2)	......
Marquette, Nebr	1.90	0.69	3.52	2.44	6.27	2.23	2.55	3.73	3.85	0.14	0.79	1.13	29.24
Mattoon, Ill	2.80	1.10	3.55	2.30	4.98	3.67	2.60	3.30	4.73	1.05	2.65	1.88	34.61
Mauzy, Ind	4.27	1.14	2.88	3.25	3.37	8.34	2.62	7.31	2.63	1.10	4.17	3.14	44.22
Mazatlan, Mex	(3)	(1)	(3)	(1)	0.00	(3)	3.88	14.22	(1)	(1)	(1)	(1)	......
McDonogh, Md	3.86	3.29	5.50	2.11	5.72	4.01	5.72	0.83	3.20	1.52	4.32	2.39	42.47
Menand Station (near Albany), N. Y	4.12	1.46	2.63	2.88	3.53	2.39	3.43	1.08	(1)	2.33	5.25	1.89	......
Merritt's Island, Fla	1.96	0.45	4.99	8.90	0.88	6.70	11.23	4.21	6.22	11.94	(1)	3.28	......
Midland, Tex	0.02	0.33	0.43	0.29	0.10	1.42	(1)	(1)	1.47	0.76	(1)	(1)	......
Milan, Tenn	6.04	6.21	4.44	4.68	3.41	4.84	2.55	3.47	4.77	0.90	8.65	2.22	52.18
Milledgeville, Ga	7.31	1.56	3.71	1.29	2.59	10.97	4.08	5.54	0.59	(3)	2.88	3.25	43.77
Milton, Mass	5.17	7.70	1.86	3.56	3.95	1.56	2.14	3.29	2.89	3.89	3.13	4.16	43.30
Minneapolis, Minn	3.01	0.55	1.51	3.62	0.99	5.35	2.46	2.33	5.44	0.40	2.48	(1)	......
Monticello, Iowa	3.35	1.31	3.50	1.80	4.65	1.41	0.63	2.38	2.80	5.34	1.35	0.84	29.36
Moorestown, N. J	4.66	6.02	3.54	3.16	6.80	3.18	5.17	2.44	1.02	2.47	4.21	4.00	46.67
Mottsville, Mich	1.75	(1)	(1)	2.06	1.12	1.75	0.12	2.88	7.88	(1)	0.75	1.63	......
Mountainville, N. Y	5.15	3.94	3.80	4.61	4.21	2.91	4.77	4.35	(1)	(1)	(1)	(1)	......
Mount Angel, Oregon	(1)	(1)	(1)	(1)	(1)	4.36	4.68	0.00	19.17	4.39	(1)	12.45	......
Muscatine, Iowa	4.21	1.43	4.16	2.62	5.05	(1)	0.32	2.62	3.05	4.70	0.95	0.71	......
Napoleon, Ohio	2.25	0.47	1.38	3.29	3.78	1.05	0.23	3.61	5.15	1.42	2.97	2.57	28.17
Nashua, N. H	5.86	5.71	2.99	1.62	2.70	1.79	3.12	2.71	4.13	2.37	4.66	4.51	42.17
Neillsville, Wis	2.71	0.33	0.50	0.90	1.70	2.55	1.05	....	.....	.....	....	.....	......
New Bedford, Mass	6.74	6.97	4,99	2.11	4.40	2.08	2.74	2.95	2.17	4.49	3.74	6.92	50.30
Newport, Vt	3.48	3.23	2.50	2.35	4.57	4.55	4.60	5.00	4.66	2.24	7.80	2.81	47.79
New Ulm, Tex	1.13	1.65	4.75	2.01	0.05	0.68	2.10	4.64	7.81	0.92	1.50	0.97	28.21
New Westminster, B. C	9.43	4.92	4.61	3.28	2.35	1.70	2.40	1.60	(1)	5.28	(1)	15.89	......
Nicolaus, Cal	5.32	0.49	1.50	4.93	0.15	0.00	0.00	(3)	0.00	0.89	0.04	1.99	15.31
Ninnescah, Kans	2.00	1.47	1.01	1.22	0.25	7.61	8.91	(1)	(1)	(1)	0.18	0.22	......
North Colebrook, Conn	5.65	2.93	2.59	1.50	2.53	1.19	0.58	1.51	1.58	1.32	2.55	1.35	25.28
North Lewisburgh, Ohio	4.30	1.55	2.60	2.25	7.55	1.05	4.65	4.55	6.10	1.80	4.20	2.42	43.02
Oakland, Cal	8.12	0.30	2.57	5.11	0.30	0.00	(1)	0.00	0.05	1.59	0.45	3.60	......
Orono, Me	6.64	5.42	2.87	1.80	4.67	2.74	1.05	2.27	4.11	1.42	8.67	6.38	48.04
Oroville, Cal	5.17	0.36	2.70	5.48	0.50	0.00	(3)	(3)	0.00	0.63	0.29	2.75	17.88
Oskaloosa, Iowa	2.34	0.35	1.43	2.25	5.69	0.62	(3)	1.11	5.29	8.20	1.30	0.51	24.09
Pacolet, S. C	6.95	2.34	6.43	3.78	13.23	9.20	(1)	7.01	1.54	0.06	3.04	2.99	......
Palermo, N. Y	3.90	2.36	1.68	2.13	1.07	3.44	1.83	2.30	3.70	1.85	4.31	2.97	31.54
Paramaribo (Dutch Guiana), S. A	8.53	3.00	1.01	6.03	9.77	11.91	14.42	6.75	(1)	2.64	9.04	12.13	......
Parkersburgh, W. Va	7.21	0.28	4.39	2.86	5.29	5.31	4.31	2.52	1.94	0.83	4.78	1.98	41.70
Paterson, N. J	4.64	5.42	3.84	3.83	5.94	(1)	5.43	(1)	(1)	3.01	3.85	1.93	......
Pekin, Ill	(1)	3.65	2.70	2.71	(1)	1.99	1.02	5.53	7.05	1.38	0.87	1.18	......
Pen Yan, N. Y	2.58	1.06	1.18	3.64	1.67	2.40	4.24	4.30	2.76	1.90	4.49	1.51	31.73
Pentwater, Mich	3.36	2.85	4.24	1.89	0.77	0.44	0.49	4.58	6.65	3.58	2.91	2.94	34.70
Peoria, Ill	2.41	1.86	2.25	2.75	2.90	3.67	0.47	3.30	4.68	1.81	1.34	0.89	28.33
Phillipsburgh, N. J	2.92	4.91	3.66	2.52	6.24	3.31	3.06	1.81	....	.....	.....	.....	......
Philipsburgh, Pa	(1)	(1)	(1)	0.76	0.31	5.70	1.80	3.09	4.80	1.70	5.70	4.60	......
Pierce City, Mo	2.10	1.80	3.30	2.50	2.20	7.40	8.40	3.10	4.30	2.50	1.80	(1)	......
Portsmouth, Ohio	3.70	(1)	3.88	3.28	5.22	6.75	3.82	3.98	3.99	1.25	5.22	2.42	......
Post Mills Village, Vt	.....	....	.....	.....	...	1.50	3.05	2.20	3.04	1.85	6.45	0.60	......
Poultney, Vt	3.72	3.94	2.75	2.33	2.87	3.31	4.75	3.97	4.09	2.40	7.75	2.10	43.98
Poway, Cal	6.34	2.64	3.24	2.67	0.00	0.00	(3)	0.02	0.00	0.10	1.50	0.20	16.71
Prairie du Chien, Wis	3.26	0.95	2.36	2.10	2.86	1.56	1.51	2.82	3.45	4.33	1.13	1.03	27.36
Princeton, Cal	3.91	0.17	0.92	3.53	0.35	0.00	(1)	(3)	0.00	0.53	0.02	1.57	......
Princeton, Mass	5.28	5.32	3.54	2.85	3.80	1.80	4.49	3.18	3.93	2.97	5.55	4.21	46.98

[1] No record. [2] Incomplete. [3] Inappreciable.

Monthly and annual precipitation (in inches and hundredths), from reports made by voluntary observers of the Signal Service, U. S. Army, etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Puerto de Luna, N. Mex	1.04	0.71	0.81	0.39	(1)	1.09	(1)	(1)	3.85	.....	.....	.....	.....
Quakerstown, Pa	3.68	5.74	4.46	2.64	6.66	5.06	4.86	(1)	1.17	2.65	4.89	2.43	.....
Quitman, Ga	3.55	2.10	9.10	2.50	(1)	(1)	(1)	(1)	(1)	0.30	1.90	2.65	.....
Raleigh, N. C	2.40	2.10	3.80	4.80	1.70	4.80	5.25	6.90	4.20	0.90	1.06	2.00	39.90
Rappahannock, Va	.....	.....	.....	.....	.....	.....	7.10	1.44	2.64	1.00	3.98	2.45	.....
Receiving Reservoir, D. C	4.97	3.20	4.58	4.45	8.56	6.07	8.12	1.07	2.04	1.13	3.71	(1)	.....
Reidsville, N. C	1.75	0.21	0.69	1.62	6.57	8.88	4.06	1.11	0.13	0.55	1.26	(1)	.....
Richardton, Dak	1.10	1.00	1.00	2.40	(1)	2.80	2.75	1.40	(1)	0.80	0.80	0.90	.....
Richmond, Ky	4.53	5.62	5.02	3.98	4.96	(1)	(1)	(1)	2.67	0.78	4.84	3.89	.....
Riley, Ill	3.60	1.61	3.68	3.76	3.13	1.89	0.81	5.85	2.25	2.55	0.98	1.13	31.24
Rockford, Ill	5.87	3.40	4.55	4.36	4.93	2.74	0.85	8.41	2.25	4.03	1.61	1.65	44.15
Roseland, N. J	...	.....	.....	.....	6.01	(1)	3.16	1.79	1.27	3.07	4.02	3.22	.....
Ruggles, Ohio	2.90	1.00	2.00	2.20	3.15	1.45	4.00	2.70	4.40	0.80	4.60	.....	.....
Sacramento, Cal	6.26	0.35	2.33	4.12	0.12	(2)	0.00	0.00	0.00	0.79	0.11	2.13	.....
Salida, Colo	(1)	0.17	0.17	3.74	0.16	(1)	1.61	(1)	0.90	.....	.....	.....	.....
Salinas, Kans	2.02	0.04	0.07	1.09	3.07	2.03	5.01	4.00	1.03	2.03	0.07	1.05	21.51
Salinas City, Cal	5.10	1.47	2.16	3.83	0.20	0.00	(2)	0.00	0.00	0.62	0.82	0.72	14.92
Salt Cay, B. W. I	1.94	1.53	(1)	4.69	1.22	2.09	0.59	2.59	(1)	3.92	(1)	1.84	.....
Sandwich, Ill	(1)	0.77	2.45	(1)	3.06	1.28	2.03	3.01	5.13	1.65	1.47	1.30	.....
Santa Barbara, Cal	5.12	1.19	2.03	3.40	(1)	0.00	(2)	(2)	(1)	(1)	0.87	0.86	.....
Setauket, N. Y	3.76	7.08	3.18	4.21	3.13	3.72	7.43	3.00	1.03	4.15	3.43	4.43	48.55
Silver Falls, Tex	(2)	(2)	(1)	1.87	0.01	1.07	3.06	3.43	5.58	3.44	0.03	(2)	.....
Snowville, Va	(1)	1.60	(1)	3.90	4.30	(1)	3.60	4.70	(1)	1.12	4.70	(1)	.....
Somerset, Mass	5.09	8.70	4.09	2.08	4.19	1.29	2.04	3.53	2.00	3.82	4.43	5.54	46.86
South Evanston, Ill	3.33	2.25	2.28	2.16	3.05	1.30	1.61	3.58	3.79	1.46	0.96	1.94	27.71
Southington, Conn	3.93	5.47	3.35	3.57	2.28	2.25	3.80	2.35	(1)	1.60	3.98	3.89	.....
South Orange, N. J	5.50	4.60	3.47	3.00	4.78	2.50	3.48	1.10	1.00	2.40	4.12	3.55	39.50
Spartanburgh, S. C	8.70	2.30	7.70	4.20	1.36	11.60	5.45	7.69	1.00	0.06	4.50	4.55	59.11
Spiceland, Ind	3.75	1.01	2.72	2.20	3.60	6.01	3.43	6.88	2.47	1.00	3.00	(1)	.....
Springfield, Mo	1.55	3.43	1.50	2.90	9.30	(1)	1.75	(1)	(1)	0.40	1.80	.....	.....
Stateburgh, S. C	2.48	1.46	4.40	1.41	3.13	5.35	4.76	2.12	2.05	2.02	0.87	2.56	32.61
Statesville, N. C	5.97	2.74	4.91	4.10	8.91	6.26	5.46	5.97	1.08	0.36	5.01	3.08	53.85
Sterling, Kans	1.45	11.50	3.35	4.50	1.00	5.03	3.86	4.77	0.90	2.00	(1)	(1)	.....
Stockham, Nebr	3.60	0.75	2.00	1.60	4.30	3.55	2.40	6.75	1.85	0.20	1.10	0.41	28.51
Strafford, Vt	4.60	2.70	2.20	2.60	2.90	2.20	3.90	3.20	4.52	2.03	4.97	2.07	37.89
Sunman, Ind	3.54	1.69	2.80	4.14	6.09	6.68	3.86	7.38	1.52	1.22	5.10	2.70	46.72
Susanville, Cal	4.09	0.62	3.00	1.15	1.12	1.22	0.57	0.03	(1)	1.32	(1)	2.23	.....
Sycamore, Ill	(1)	1.85	3.85	5.14	4.24	2.27	0.67	4.29	3.23	2.26	0.96	1.54	.....
Tacoma, Wash	7.71	2.29	3.35	3.67	1.84	1.03	1.44	0.44	2.12	8.78	1.59	11.09	40.35
Tallahassee, Fla	4.45	1.60	9.79	2.15	2.15	7.75	14.30	7.75	4.65	2.66	2.20	4.85	64.30
Taunton, Mass	5.17	8.85	3.52	2.14	4.26	1.23	2.64	3.81	2.62	3.13	3.95	3.74	45.06
Tecumseh, Nebr	2.00	(1)	(1)	(1)	(1)	(1)	(1)	1.01	4.06	2.65	0.80	2.00	.....
Terre Haute, Ind	2.67	1.20	3.67	2.44	3.36	2.36	1.87	3.40	5.90	0.21	3.42	(1)	.....
Thornville, Mich	2.72	1.09	1.89	2.84	3.45	1.92	2.37	3.25	4.69	1.61	2.01	3.12	30.96
Tiffin, Ohio	2.43	1.40	2.16	2.32	2.96	1.61	1.07	1.83	4.01	1.23	3.47	3.08	27.57
Topeka, Kans	1.85	0.42	1.84	1.74	3.00	4.03	(1)	3.03	1.82	(1)	(1)	(1)	.....
Traverse City, Mich	5.49	2.51	4.60	2.48	2.49	0.97	0.85	4.20	7.61	4.57	3.84	3.16	42.77
Tremont, Nebr	2.17	0.46	4.93	3.89	3.41	2.89	1.07	2.77	3.39	.....	....	.....	.....
Troy, Pa	4.18	(1)	(1)	2.12	1.23	2.97	6.28	1.82	.....	.....	.....	.....	.....
Tucson, Ariz	1.61	0.36	0.87	0.06	0.00	(1)	1.06	(1)	2.47	0.31	0.45	(1)	.....
University of Virginia (Charlottesville), Va	13.68	3.06	5.65	3.11	9.66	7.33	8.34	1.74	1.75	0.80	4.29	2.19	61.60
Upper Mont Clair, N. J	(1)	(1)	(1)	(1)	6.20	5.17	5.27	2.59	1.33	3.40	3.38	1.62	.....
Variety Mills, Va	3.82	4.02	6.16	3.15	8.22	6.21	4.91	2.88	1.42	1.07	3.81	3.06	48.73
Vermillion, Dak	1.37	0.59	2.40	3.60	2.23	2.55	(1)	(1)	(1)	(1)	2.50	.....	.....
Vevay, Ind	3.57	1.51	2.18	2.55	4.36	7.39	1.55	3.18	1.47	0.91	4.54	2.89	36.10
Vineland, N. J	4.27	5.94	3.81	2.52	4.85	2.28	6.47	4.52	1.24	2.88	3.80	3.76	46.34
Voluntown, Conn	6.40	11.25	3.95	2.52	3.25	1.65	2.37	(1)	2.10	1.60	4.30	6.15	.....
Wakefield, Kans	0.55	0.76	0.80	4.31	3.07	4.12	(1)	(1)	(1)	(1)	1.06	1.20	.....
Wake Forest, N. C	2.99	2.35	4.22	3.28	3.87	(1)	(1)	2.69	4.80	2.36	2.11	3.63	.....
Wausau, Wis	3.08	1.09	1.79	2.29	0.95	2.55	1.48	4.47	3.23	3.21	2.32	0.43	26.89
Wauseon, Ohio	2.78	0.84	1.56	3.19	2.69	2.01	0.31	4.86	4.47	1.94	2.66	3.07	30.38
Webster, Dak	1.24	1.93	2.02	7.72	6.22	8.91	1.37	2.36	1.71	1.77	4.33	2.82	41.90
Weir's Bridge, N. H	3.93	4.49	3.19	1.54	2.72	2.38	4.47	3.54	4.17	3.58	4.63	4.26	42.90
Weldon, N. C	2.88	2.16	4.01	2.06	2.14	6.75	10.40	5.02	1.75	2.38	2.21	3.76	45.49
Wellington, Kans	1.53	1.08	1.59	3.25	0.88	7.71	5.65	2.96	2.76	1.29	0.10	0.08	28.88
Wellsborough, Pa	12.17	0.95	8.25	10.77	1.51	2.01	4.63	2.79	4.11	1.88	6.50	1.50	57.07
Westborough, Mass	5.74	6.28	3.63	2.40	3.01	1.63	3.38	4.41	2.76	2.98	4.82	4.06	45.10
West Chester, Pa	5.98	6.22	4.87	3.80	7.00	4.30	6.31	1.27	1.10	3.06	4.48	4.88	53.27
Westerville, Ohio	3.16	1.64	2.11	1.91	4.75	2.11	1.33	2.51	4.77	1.83	3.22	1.95	30.79
West Leavenworth, Kans	0.98	(1)	0.34	1.01	10.80	5.25	1.60	1.00	2.90	3.10	3.00	2.10	.....
West Milton, Ohio	4.00	1.00	3.50	4.00	6.00	8.00	6.75	7.75	7.50	3.00	6.00	3.50	61.00
Westmoreland, Kans	3.62	1.20	3.50	5.75	5.78	3.37	0.87	0.75	2.75	1.62	0.56	(1)	.....
West Union, Iowa	3.51	0.88	1.28	1.98	3.60	1.77	0.66	(1)	(1)	3.30	1.36	0.57	.....
White Plains, N. Y	5.70	6.40	2.65	3.64	4.52	4.12	4.22	2.32	1.79	2.49	(1)	2.19	.....

[1] No record. [2] Inappreciable.

Monthly and annual precipitation (in inches and hundredths), from reports made by voluntary observers of the Signal Service, U. S. Army, etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Wilkes Barre, Pa	4.26	2.52	4.10	2.19	7.04	2.95	3.75	(1)	4.77	(1)	5.80	2.27	......
Williamstown, Mass	3.92	2.61	5.01	1.56	4.77	2.72	4.20	1.56	4.31	2.60	5.80	4.04	43.10
Windsor, Ill	4.32	1.22	2.60	2.17	5.53	6.59	1.51	3.08	3.82	1.04	2.37	1.85	36.10
Wolfaborough, N. H	4.99	5.44	2.28	2.20	3.18	2.70	3.21	3.19	4.63	3.58	5.10	5.00	45.50
Woodstock, Md	5.45	4.79	5.74	2.17	7.36	4.54	5.97	2.21	1.61	1.90	3.50	2.11	47.35
Woodstock, N. H	4.71	4.19	4.13	1.55	3.48	2.30	3.45	3.87	4.07	3.01	6.13	4.25	45.14
Worcester, Mass	6.52	6.32	3.57	2.26	(1)	2.15	3.93	3.81	3.53	2.75	5.19	4.24	......
Wyandotte, Kans	1.32	0.67	1.81	1.80	4.84	4.20	0.13	1.30	2.50	1.45	1.26	1.18	22.46
Wysox, Pa	3.54	0.95	2.82	2.88	2.57	2.60	5.02	1.43	4.25	2.21	6.12	1.08	35.47
Wytheville, Va	3.88	1.50	5.31	5.75	(1)	4.59	6.65	4.78	0.48	0.87	4.66	3.35	......
Yates Center, Kans	1.64	1.62	1.83	1.70	2.87	3.11	3.99	3.57	3.85	1.16	1.54	0.49	27.37
Yellow Springs, Ohio	3.67	2.36	1.94	3.98	6.27	4.54	2.81	4.67	5.09	1.46	3.11	2.71	42.61
Zionville, Pa	(1)	6.00	7.00	1.13	5.01	4.58	4.28	0.54	1.26	2.71	6.08	1.24	......

[1] No record.

APPENDIX No. 29.

Monthly and annual precipitation (in inches and hundredths) at military post hospitals for the year ending December 31, 1886.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Abraham Lincoln, Fort, Dak	0.94	0.70	0.88	1.44	1.70	2.20	1.40	1.90	0.38	0.80	0.40	1.20	13.94
Alcatraz Island, Cal	7.00	0.15	1.52	4.20	0.25	0.00	0.15	0.00	0.02	1.30	1.02	1.85	17.46
Angel Island, Cal	7.17	0.12	1.75	5.43	0.35	0.00	0.24	0.00	0.00	1.49	0.73	2.00	19.28
Assinaboine, Fort, Mont	0.12	0.39	1.18	1.83	0.54	0.86	0.20	0.17	0.99	0.11	....	....	....
Bayard, Fort, N. Mex	1.05	1.07	0.18	[1]	[2]	1.16	1.16	1.90	2.93	1.60	0.00	0.00	....
Benicia Barracks, Cal	5.98	0.07	2.28	4.76	0.14	0.00	0.01	0.00	[2]	1.46	0.36	1.42	16.48
Bidwell, Fort, Cal	5.91	1.22	0.78	2.20	1.44	0.78	0.41	0.04	[2]	1.93	0.47	3.92	19.10
Boisé City, Idaho	2.53	0.30	0.83	1.59	0.54	0.32	0.04	[2]	0.00	0.42	0.36	2.28	9.21
Brady, Fort, Mich	4.04	4.04	1.78	2.04	1.92	3.12	1.50	1.42	3.26	5.69	1.44	1.04	31.29
Bridger, Fort, Wyo	4.19	0.60	1.18	1.34	2.00	0.30	0.00	....	....	....	....	....	....
Clark, Fort, Tex	0.12	1.20	1.70	0.45	[1]	[1]	0.03	1.76	....	....	....	....	....
Columbus, Fort (N. Y. H.), N. Y.	4.39	[1]	3.33	3.48	5.08	3.24	2.96	1.00	1.81	[1]	4.04	....	....
Concho, Fort, Tex	0.15	0.80	[1]	0.48	1.52	1.60	0.36	3.74	0.76	1.35	0.00	[2]	....
Cœur d'Alene, Fort, Idaho	3.63	0.89	2.16	1.50	1.89	1.51	[2]	0.04	0.79	5.38	1.52	2.05	21.36
David's Island (N. Y. H.), N. Y.	4.93	3.20	2.33	1.75	4.15	2.82	3.06	1.27	1.84	2.18	....	....	....
Ellis, Fort, Mont	0.88	1.16	1.68	3.78	1.45	2.83	1.18	1.01	....	....	....	....	....
Fred Steele, Fort, Wyo	0.28	0.24	0.62	1.08	[2]	0.04	0.42	....	....	....	....	....	....
Gaston, Fort, Cal	15.02	5.29	2.38	9.23	[1]	0.00	0.35	0.00	0.00	3.36	1.27	15.81	....
Gibson, Fort, Ind. T	....	....	....	....	0.55	3.00	3.25	3.00	3.75	2.75	0.50	0.04	....
Halleck, Fort, Nev	1.94	0.50	1.10	1.18	0.29	0.38	0.80	0.24	0.20	2.36	....	....	....
Hays, Fort, Kans	1.52	0.44	2.39	3.16	1.80	3.60	6.66	2.41	3.06	1.44	0.68	0.68	27.84
Huachuca, Fort, Ariz	1.18	1.94	0.20	[2]	0.00	0.00	1.41	4.24	1.46	0.84	[2]	0.20	11.47
Keogh, Fort, Mont	0.50	0.50	0.68	0.26	5.62	2.28	0.20	0.32	0.34	1.36	0.40	0.34	12.80
Klamath, Fort, Oregon	3.62	1.86	1.54	2.03	0.90	1.11	1.06	0.02	0.00	0.97	0.27	2.07	15.45
Laramie, Fort, Wyo	[1]	0.07	0.36	0.47	0.14	0.91	1.19	1.06	0.30	0.04	0.55	0.32	....
Lewis, Fort, Colo	3.91	1.45	0.88	2.74	0.72	0.32	[2]	3.99	1.62	2.02	1.74	0.26	19.65
Lowell, Fort, Ariz	[1]	[1]	1.12	0.14	0.00	0.00	[2]	1.24	1.04	0.12	0.12	....	....
Madison Barracks, N. Y	2.62	2.12	2.72	1.84	2.16	1.08	2.38	3.92	[1]	2.10	3.00	1.88	....
Mason, Fort, Cal	4.68	[2]	1.74	5.08	0.20	0.00	0.08	0.00	0.00	1.20	0.72	1.36	15.06
McDermitt, Fort, Nev	1.59	0.40	0.50	2.02	0.19	0.82	0.80	2.06	[2]	1.90	0.76	2.52	13.56
McDowell, Fort, Ariz	3.20	1.54	1.12	0.20	0.00	0.00	0.10	2.04	[1]	0.30	0.30	0.30	9.10
McHenry, Fort, Md	4.58	3.28	4.80	2.68	6.86	6.08	9.08	3.74	1.22	1.42	2.20	1.29	47.23
McIntosh, Fort, Tex	0.30	0.79	1.26	1.50	0.95	4.64	1.51	2.76	4.40	[1]	[2]	0.00	....
McKinney, Fort, Wyo	1.00	0.40	0.30	1.05	[1]	1.55	1.70	0.40	0.70	1.80	0.45	0.15	....
Meade, Fort, Dak	0.32	0.67	[1]	2.17	0.57	0.90	3.38	1.50	0.40	0.40	1.60	0.72	....
Missoula, Fort, Mont	1.92	0.49	0.37	1.04	0.51	1.58	0.60	0.30	1.08	0.58	0.50	1.90	10.87
Monroe, Fort, Va	1.92	3.30	1.35	2.22	4.23	7.20	2.64	6.33	[1]	2.20	1.55	5.85	....
Mount Vernon Barracks, Ala	7.12	2.37	7.59	7.11	2.53	7.41	6.50	6.90	0.76	0.00	7.03	1.42	56.74
Mojave, Fort, Ariz	1.50	0.36	0.92	0.84	0.00	0.00	0.00	[1]	[1]	0.00	0.28	....	....
Niagara, Fort, N. Y	1.24	1.58	1.99	1.56	1.14	1.67	1.06	1.57	[1]	0.77	2.44	1.00	....
Niobrara, Fort, Nebr	1.08	0.84	1.72	2.21	1.14	2.04	1.32	1.82	1.28	0.26	0.60	0.80	15.11
Pembina, Fort, Dak	2.25	4.59	0.35	2.85	1.55	3.60	3.30	0.25	3.90	1.10	3.80	1.70	29.24
Plattsburgh Barracks, N. Y	1.15	1.22	1.42	2.06	1.48	4.72	3.77	3.97	2.36	0.76	2.30	0.17	25.38
Presidio of San Francisco, Cal	6.77	0.10	1.92	4.86	0.20	0.00	0.20	0.00	[2]	0.44	0.48	1.18	16.15
Randall, Fort, Dak	0.41	0.32	1.50	3.39	2.62	2.02	0.24	4.25	4.05	0.91	1.04	0.95	21.70
Reno, Fort, Ind. T	[1]	1.25	0.00	2.80	0.31	2.86	0.82	0.34	1.24	4.17	0.00	0.00	....
Riley, Fort, Kans	0.58	[1]	1.05	2.68	3.10	2.98	2.46	1.38	0.32	1.74	0.80	0.62	....
Ringgold, Fort, Tex	0.34	1.58	0.12	[2]	0.94	2.08	1.27	0.38	6.82	[2]	0.48	[2]	14.01
Robinson, Fort, Nebr	0.67	0.57	1.74	0.47	1.24	1.91	0.74	0.90	0.30	0.31	1.12	1.11	11.08
Saint Augustine, Fla	4.30	3.32	7.61	3.79	1.83	4.67	6.87	6.70	3.63	10.30	0.35	3.93	57.30
Seldon, Fort, N. Mex	[1]	0.10	0.00	[1]	0.00	0.62	[1]	1.05	3.25	2.27	0.60	0.00	....
Shaw, Fort, Mont	0.85	1.04	0.55	2.30	0.63	1.64	0.82	0.28	1.10	0.94	....	....	....
Sidney, Fort, Nebr	1.30	0.13	0.59	0.64	1.52	0.52	1.64	1.04	0.60	0.40	0.16	0.33	8.87
Sisseton, Fort, Dak	0.60	0.65	0.55	3.06	1.64	2.72	1.23	1.60	0.78	1.00	0.96	0.32	15.11
Snelling, Fort, Minn	1.98	0.40	0.95	4.80	1.06	4.52	2.44	3.13	3.16	0.80	1.82	0.98	26.04
Spokane, Fort, Wash	1.32	0.28	[2]	0.08	0.94	0.46	0.00	[1]	0.28	0.58	0.06	1.92	....
Sully, Fort, Dak	0.11	0.17	0.86	2.32	1.01	4.29	1.75	1.15	0.50	0.45	1.72	0.74	15.07
Supply Fort, Ind. T	0.76	0.40	0.34	1.73	0.06	3.54	0.98	0.92	0.20	1.32	0.10	0.00	10.35
Totten, Fort, Dak	0.80	0.67	0.73	1.03	2.87	3.14	0.98	0.89	0.84	1.38	0.65	0.49	14.47
Townsend, Fort, Wash	1.86	0.37	0.54	1.62	0.76	0.24	0.37	0.23	0.28	2.61	1.28	5.10	15.26
Union Fort, N. Mex	0.98	[2]	0.50	3.22	0.13	1.66	1.18	3.04	3.94	0.96	0.35	0.45	21.41

[1] No record. [2] Inappreciable.

Monthly and annual precipitation at military post hospitals, etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Verde, Fort, Ariz	([1])	0.96	1.20	([2])	0.00	0.02	0.14	......	......	......	......	......	......
Walla Walla, Wash	([1])	([1])	([2])	0.92	0.48	0.56	0.02	0.16	0.09	1.88	0.57	7.86	......
Washakie, Fort, Wyo	0.04	0.10	2.05	3.13	1.00	2.46	1.26	0.00	0.17	([1])	2.29	0.27	......
West Point, N. Y	6.80	4.24	3.98	3.70	4.16	3.60	4.40	4.60	1.70	2.10	4.30	3.00	46.58
Wingate, Fort, N. Mex	2.52	0.94	0.82	1.08	0.24	0.34	0.42	2.96	1.06	1.50	0.46	0.10	12.44
Yates, Fort, Dak	0.26	0.22	0.68	2.80	1.92	2.20	2.64	3.21	0.72	0.70	0.58	1.60	17.53

[1] No record. [2] Inappreciable.

APPENDIX No. 30.

Precipitation (in inches and hundredths) at the cotton-region stations of the Signal Service, United States Army, for the months April to October, 1886, inclusive.

Districts and stations.	April.	May.	June.	July.	August.	September.	October.
Atlanta, Ga.:							
Anderson, S. C	[1]1.94	10.39	8.63	6.51	5.61	1.27	0.00
Atlanta, Ga	[1]1.44	6.21	8.66	2.10	2.36	0.53	0.03
Cartersville, Ga	[1]2.21	4.91	10.47	4.84	3.88	2.02	0.40
Columbus, Ga	[1]2.04	2.12	8.48	6.54	6.49	0.74	0.25
Gainesville, Ga	[1]2.63	7.25	4.63	1.91	2.87	1.08	0.06
Greenville, S. C	[1]1.35	8.36	10.99	6.06	7.38	1.73	0.00
Griffin, Ga	[1]0.68	5.35	7.06	3.04	2.82	0.98	0.05
Macon, Ga	[1]1.81	2.03	6.51	8.73	2.36	0.32	0.22
Newnan, Ga	[1]0.58	5.10	9.99	3.83	3.05	1.90	0.00
Spartanburgh, S. C	[1]2.08	11.99	11.65	10.10	6.07	1.69	0.00
Toccoa, Ga	[1]2.34	7.62	6.56	6.08	7.20	1.04	0.06
West Point, Ga	[1]1.96	3.75	9.23	1.86	4.28	0.42	0.00
Augusta, Ga.:							
Allendale, S. C	[1]3.31	4.32	7.89	5.82	8.36	3.03	0.00
Athens, Ga	[1]0.12	7.44	8.48	4.19	3.26	0.89	0.00
Augusta, Ga	[1]0.99	6.29	9.14	7.83	2.48	0.65	0.14
Batesburgh, S. C	[1]1.10	5.13	6.06	4.80	2.62	2.50	0.14
Blackville, S. C	[1]0.94	4.69	9.36	7.26	3.94	2.91	0.81
Camak, Ga	[1]0.56	4.39	6.12	4.90	4.64	1.40	0.10
Chester, S. C	[2]1.46	7.08	13.52	5.11	4.24	0.25	0.80
Columbia, S. C	[1]1.52	9.41	6.26	6.23	3.37	2.96	0.19
Greenwood, S. C	[1]2.01	8.28	7.32	6.24	4.58	1.65	0.00
Union Point, Ga	[1]0.66	0.45	7.60	5.29	4.07	0.95	0.59
Washington, Ga	[1]0.48	5.23	5.51	3.61	7.60	1.48	0.22
Waynesborough, Ga	[1]1.07	2.29	10.07	5.07	5.03	4.57	0.00
Charleston, S. C.:							
Branchville, S. C	[1]0.75	3.03	10.90	6.86	4.48	2.04	1.80
Charleston, S. C	[1]0.96	0.88	8.27	6.79	3.28	3.03	0.01
Hardeeville, S. C	[1]1.72	1.98	9.23	7.40	3.56	0.63	0.58
Jacksonborough, S. C	[1]1.50	1.07	[3]10.70	3.86	2.60	2.10	0.70
Kingstree, S. C	[2]1.10	2.00	10.16	8.70	4.23	1.07	0.60
Saint George's, S. C	[1]1.03	3.60	7.19	5.15	6.77	2.46	1.02
Saint Matthew's, S. C	[2]1.16	[4]1.17	9.49	6.21	3.36	1.11	0.71
Yemassee	[1]2.00	1.33	14.49	4.22	([6])	3.75	0.02
Galveston, Tex.:							
Austin, Tex	[1]3.22	0.00	1.28	2.35	3.34	5.03	0.58
Belton, Tex	[1]4.06	0.00	1.60	2.00	3.26	4.89	0.94
Brenham, Tex	[1]3.10	([5])	2.45	2.70	4.19	7.27	0.95
Columbia, Tex	[1]1.69	0.00	1.33	1.83	3.79	15.86	0.00
Corsicana, Tex	[1]2.18	0.00	2.20	3.51	0.30	2.60	([6])
Cuero, Tex	[1]1.86	0.92	0.77	2.17	1.65	4.63	0.00
Dallas, Tex	[1]1.47	0.02	1.45	1.37	4.56	6.29	1.70
Galveston, Tex	[1]2.06	0.03	6.19	1.20	2.15	13.30	1.93
Hearne, Tex	[1]4.65	0.00	0.45	2.15	1.72	6.50	2.00
Houston, Tex	[1]4.08	0.05	5.84	1.37	3.59	12.83	0.67
Huntsville, Tex	[2]3.62	0.60	3.36	1.13	2.18	3.37	0.00
Longview, Tex	[1]4.19	0.00	1.99	2.66	1.16	4.90	2.11
Luling, Tex	([7])	0.00	0.05	1.96	6.30	5.25	1.00
Orange, Tex	([7])	0.03	0.48	0.02	0.00	2.54	0.00
Sour Lake, Tex	[8]6.41	0.01	5.50	0.13	1.39	8.93	9.45
Tyler, Tex	[1]0.90	0.60	0.76	2.45	0.50	4.75	0.10
Waco, Tex	([7])	0.00	2.30	0.70	0.95	5.65	0.60
Weatherford, Tex	([9]) ([7])	0.00	1.07	0.97	1.47	3.83	0.21
Weimar, Tex	[1]4.51	0.00	1.52	0.67	3.79	5.85	0.78
Little Rock, Ark.:							
Arkansas City, Ark	([7])	0.55	5.13	4.95	4.49	5.26	[10]1.97
Brinkley, Ark	([6])	0.73	6.51	5.24	1.92	3.49	0.80
Devall's Bluff, Ark	([6])	1.22	5.14	4.22	7.56	4.18	0.07
Forest City, Ark	([6])	1.54	6.12	1.77	1.92	3.23	0.52

[1] For 21 days.
[2] For 20 days.
[3] For 22 days.
[4] For 16 days.
[5] Inappreciable.
[6] No record.
[7] Incomplete.
[8] For 17 days.
[9] For 19 days.
[10] For 24 days.

Precipitation at the cotton-region stations of the Signal Service, etc.—Continued.

Districts and stations.	April.	May.	June.	July.	August.	September.	October.
Little Rock, Ark.—Continued:							
Helena, Ark	([1])	2.00	5.60	1.80	1.50	7.00	0.38
Kensett, Ark	([1])	[2]0.04	0.81	4.48	2.51	3.20	0.80
Little Rock, Ark	[3]2.37	1.13	9.28	2.40	5.31	6.24	1.07
Magnolia, Ark	([1])	0.12	9.96	2.00	0.08	6.93	1.25
Malvern, Ark	([1])	[4]0.70	7.40	4.94	2.00	7.00	0.50
Monticello, Ark	([1])	0.43	4.65	0.43	1.07	4.65	1.97
Newport, Ark	([1])	([5])	5.23	1.30	1.27	2.37	0.06
Paris, Tex	([1])	[4]0.00	5.27	2.92	1.04	6.36	0.82
Pine Bluff, Ark	([1])	0.33	3.70	0.00	0.00	9.66	0.53
Prescott, Ark	([1])	([1])	([5])	0.29	0.45	4.37	1.10
Russellville, Ark	([1])	0.38	6.82	5.69	1.89	5.15	0.91
Texarkana, Ark	([1])	0.00	5.41	0.85	0.00	8.65	4.53
Memphis, Tenn.:							
Arlington, Tenn	[3]0.22	0.51	0.73	0.39	0.54	0.72	0.00
Batesville, Miss	[3]6.05	1.79	6.35	2.03	2.76	5.23	0.87
Bolivar, Tenn	[3]3.65	7.40	8.48	3.11	3.78	4.54	0.00
Brownsville, Tenn	[3]5.37	8.52	9.35	3.16	6.39	3.59	0.71
Corinth, Miss	[3]0.27	0.04	0.59	([6])	0.31	0.35	0.06
Covington, Tenn	[3]2.22	7.05	5.32	2.39	4.99	2.90	0.75
Decatur, Ala	[3]1.61	3.95	5.78	1.43	1.54	3.78	0.15
Dyersburgh, Tenn	[3]2.66	5.41	5.06	1.76	3.31	2.51	0.92
Grand Junction, Tenn	[3]3.90	2.58	10.48	2.39	5.21	3.99	1.07
Grenada, Miss	[3]6.07	1.32	6.24	4.07	2.14	4.22	1.47
Hernando, Miss	[3]2.33	2.96	11.51	1.80	5.54	6.40	0.72
Holly Springs, Miss	[3]5.21	5.09	11.85	3.21	5.00	4.07	1.75
Memphis, Tenn	[3]2.06	2.11	8.06	5.52	6.49	6.20	0.59
Milan, Tenn	[3]3.72	3.29	4.80	2.04	3.27	4.51	0.62
Oxford, Miss	[3]6.37	4.16	9.41	2.83	4.63	5.03	1.35
Paris, Tenn	[3]3.47	2.69	7.08	0.18	4.66	1.47	0.57
Scottsborough, Ala	[3]1.59	5.99	5.38	2.15	3.96	1.85	0.00
Tuscumbia, Ala	[3]2.37	4.67	8.99	1.13	3.61	6.26	([6])
Mobile, Ala.:							
Aberdeen, Miss	[3]4.30	2.49	13.50	1.69	6.29	2.48	0.12
Columbus, Miss	[3]4.47	4.39	10.50	2.20	4.64	1.43	0.10
Evergreen, Ala	[3]3.55	1.63	8.41	7.76	3.15	1.10	0.00
Livingston, Ala	([1])	9.55	6.14	3.55	2.30	0.40	0.85
Macon, Miss	[4]6.03	1.84	7.67	2.80	3.47	1.10	0.25
Meridian, Miss	[3]4.53	1.80	5.50	0.20	0.60	1.30	0.06
Mobile, Ala	[3]4.69	1.27	5.94	6.59	3.55	2.69	0.13
Okolona, Miss	[4]5.39	1.41	11.71	2.90	3.43	4.60	0.36
Waynesborough, Miss	[3]9.67	2.82	8.76	3.07	3.57	1.18	0.60
Montgomery, Ala.:							
Birmingham, Ala	[3]2.36	2.80	6.02	2.25	4.43	0.44	([6])
Calera, Ala	[3]1.84	5.50	7.22	2.42	6.32	([1])	([1])
Eufaula, Ala	[3]1.72	3.53	5.84	5.17	5.65	0.78	0.00
Fort Deposit, Ala	[2]5.31	1.95	5.61	6.49	3.46	0.39	0.02
Greenville, Ala	[3]5.67	1.86	10.08	3.51	2.22	0.95	0.00
Marion, Ala	[3]4.60	3.45	4.33	4.95	4.42	6.30	0.86
Montgomery, Ala	[3]6.27	2.95	8.61	3.37	5.37	1.12	0.03
Opelika, Ala	[3]2.20	5.82	10.73	5.13	4.61	0.53	0.00
Pine Apple, Ala	[3]8.26	2.79	6.62	6.37	2.66	0.21	0.00
Selma, Ala	([5])	2.90	6.11	7.37	6.54	0.42	0.42
New Orleans, La.:							
Alexandria, La	[3]8.61	0.28	36.91	5.02	2.04	8.56	2.57
Amite City, La	[3]9.03	2.51	9.12	8.22	3.70	2.19	0.80
Brookhaven, Miss	[3]11.23	3.52	11.34	4.46	6.29	1.97	0.01
Cheneyville, La	[3]7.88	0.15	26.59	5.25	2.55	2.77	([5])
Coushatta Chute, La	[3]3.52	0.00	6.58	3.91	3.35	8.34	2.03
Hazlehurst, Miss	[3]8.32	0.22	0.64	0.19	3.12	0.38	0.03
La Fayette, La	[3]10.00	2.42	6.53	4.81	2.59	4.41	2.41
Minden, La	[3]4.79	0.00	6.27	3.95	1.12	3.57	1.96
Natchez, Miss	[3]12.01	0.97	8.19	4.57	3.15	5.80	0.75
Natchitoches, La	[3]6.49	0.00	11.58	3.02	1.67	5.07	2.26
New Orleans, La	[3]3.71	3.02	9.35	4.35	2.40	4.09	0.22
Opelousas, La	[3]4.46	0.94	10.00	5.67	0.38	4.90	3.53
Port Gibson, Miss	[3]9.75	1.44	9.56	3.71	0.71	2.87	0.04
Savannah, Ga.:							
Albany, Ga	[3]1.49	3.52	4.94	4.29	4.59	0.07	0.38
Allapaha, Ga	[3]2.36	4.07	10.93	7.16	3.27	1.55	0.57
Bainbridge, Ga	[3]2.41	[7]1.69	10.68	9.94	3.81	1.90	1.05
Eastman, Ga	[3]3.53	1.14	7.34	8.73	1.27	1.04	0.00
Fernandina, Fla	([5])	0.57	3.68	6.72	4.50	([5])	2.20

[1] No record.
[2] For 16 days.
[3] For 21 days.
[4] For 20 days.
[5] Incomplete.
[6] Inappreciable.
[7] For 24 days.

Precipitation at the cotton-region stations of the Signal Service, etc.—Continued.

Districts and stations.	April.	May.	June.	July.	August.	September.	October.
Savannah, Ga.—Continued.							
Fort Gaines, Ga	[1]3.72	3.08	6.20	4.93	5.68	0.20	0.20
Jessup, Ga	[2]1.15	3.44	11.58	9.71	9.97	1.71	1.55
Live Oak, Fla	[1]1.87	4.90	7.09	7.52	8.93	8.43	0.24
Millen, Ga	[1]1.14	2.32	11.69	6.11	3.31	1.42	0.03
Quitman, Ga	[1]1.53	4.24	6.31	8.07	4.26	1.53	1.14
Savannah, Ga	[1]1.68	4.35	6.21	7.38	7.34	1.64	0.89
Smithville, Ga	[1]2.56	3.83	9.23	6.99	3.34	0.74	0.40
Thomasville, Ga	[1]2.31	2.65	7.76	12.71	6.05	3.64	1.55
Waldo, Fla	[1]0.20	1.41	8.54	14.54	4.68	[3]1.76	2.37
Way Cross, Ga	[1]1.75	3.88	8.91	4.31	5.69	5.17	1.22
Vicksburg, Miss.:							
Edwards, Miss	[1]8.38	2.76	8.69	3.70	1.92	5.19	0.29
Jackson, Miss	[1]7.84	2.75	6.63	2.32	2.60	3.43	0.07
Lake, Miss	[1]7.08	2.25	7.53	5.20	2.28	2.85	0.99
Monroe, La	[1]6.02	0.08	8.25	3.21	2.36	5.18	2.51
Vicksburg, Miss	[1]9.54	1.52	9.63	1.58	2.42	5.13	0.64
Wilmington, N.C.:							
Cheraw, S.C	[1]1.98	3.26	9.73	4.20	8.23	1.65	0.81
Florence, S.C	[1]1.08	4.93	9.82	4.70	5.89	5.94	0.60
Goldsborough, N.C	[1]2.54	4.63	4.75	6.91	14.25	3.35	0.35
Lumberton, N.C	[2]1.51	3.26	10.51	7.09	8.18	3.24	0.20
New Berne, N.C	[1]1.27	2.54	4.25	6.66	8.96	3.38	0.34
Raleigh, N.C	[1]2.43	3.35	5.09	5.63	8.19	4.15	1.73
Salisbury, N.C	[1]2.15	13.06	6.51	8.57	5.76	0.92	0.61
Wadesborough, N.C	[1]0.30	4.17	8.21	4.50	6.16	0.17	0.22
Weldon, N.C	[1]1.15	2.48	6.90	15.33	5.29	1.80	2.00
Wilmington, N.C	[1]1.54	1.62	8.83	21.10	4.35	1.30	0.45

[1] For 21 days. [2] For 20 days. [3] For 24 days.

APPENDIX No. 31.

Mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year, 1886.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Abilene, Tex	70	65	67	62	49	58	56	61	71	67	58	59	62
Albany, N. Y	79	71	71	68	64	65	64	65	70	72	72	75	70
Alexander, Fort, Alaska[1]	86	86	87	88	84	(2)	.....	.....	.....	.....	.....	.....	.....
Alpena, Mich	83	80	83	85	76	80	79	82	84	81	83	86	82
Apache, Fort, Ariz	74	54	54	45	32	32	51	64	64	54	54	58	53
Assiniboine, Fort, Mont	60	64	62	53	46	51	49	46	57	59	60	62	56
Atlanta, Ga	74	58	64	65	66	80	76	79	75	61	62	75	70
Atlantic City, N. J	83	79	78	82	82	83	86	84	82	82	78	85	82
Augusta, Ga	76	66	67	66	65	80	80	80	82	82	84	87	76
Baltimore, Md	74	69	64	69	70	71	72	72	70	66	62	71	69
Behring's Island, Behring Sea[3]	95	92	90	90	(2)	.....	.....	.....	.....	.....	.....	.....	.....
Benton, Fort, Mont.[4]	79	66	66	67	66	48	41	45	57	(5)	(5)	.....	.....
Bidwell, Fort, Cal	84	64	67	62	46	38	32	29	36	65	69	81	56
Bismarck, Dak	75	84	84	68	59	61	51	58	59	66	76	92	69
Block Island, R. I	82	80	79	89	86	89	88	89	86	84	82	84	85
Boisé City, Idaho	83	72	61	59	52	48	42	37	44	63	71	80	59
Boston, Mass	74	71	70	69	68	71	70	72	75	75	71	70	71
Bridger, Fort, Wyo	75	68	75	68	55	62	57	61	56	72	77	70	66
Brownsville, Tex	80	80	83	82	83	86	88	85	91	83	80	82	83
Buffalo, N. Y	86	82	83	76	78	75	74	73	73	79	82	85	79
Buford, Fort, Dak	89	83	79	65	55	53	44	51	65	80	86	91	70
Cairo, Ill	79	67	65	66	71	76	73	76	75	68	65	74	71
Canby, Fort, Wash	93	89	90	86	81	80	80	74	83	88	86	92	85
Cape Henry, Va.[6]	81	74	74	81	81	82	84	83	79	77	67	79	78
Cape Mendocino, Cal.[6]	88	85	80	84	84	82	86	86	80	84	79	89	84
Cedar Keys, Fla	87	83	86	81	77	81	80	80	79	73	72	83	80
Charleston, S. C	77	69	77	75	70	80	79	82	[7]82	75	69	79	76
Charlotte, N. C	72	61	60	75	78	84	80	84	84	82	72	74	76
Chattanooga, Tenn	84	70	66	66	70	80	77	77	77	70	70	75	73
Cheyenne, Wyo	75	72	70	63	58	62	48	65	53	52	(2)	(2)	.....
Chicago, Ill	84	77	78	83	72	73	70	73	71	71	77	76	75
Chincoteague, Va	78	73	74	81	82	84	84	82	80	78	69	79	79
Cincinnati, Ohio	78	70	68	66	68	73	70	72	76	72	74	75	72
Cleveland, Ohio	83	80	79	76	80	75	71	73	70	70	69	76	75
Columbus, Ohio	79	72	76	69	73	78	80	73	73	66	70	71	73
Concordia, Kans	90	82	81	70	72	73	71	72	69	63	60	76	73
Custer, Fort, Mont	80	80	74	60	52	56	50	52	[8]61	66	74	78	65
Davenport, Iowa	78	74	74	69	70	65	61	67	68	65	66	78	70
Davis, Fort, Tex	47	43	35	35	23	46	49	47	63	56	38	30	43
Deadwood, Dak	78	73	76	73	62	64	61	64	65	68	74	80	70
Denver, Colo	67	52	65	61	37	55	48	56	53	50	61	53	55
Des Moines, Iowa	78	78	78	73	70	69	61	67	75	73	73	84	73
Detroit, Mich	80	78	77	74	75	76	75	75	76	73	74	76	76
Dodge City, Kans	84	80	78	67	64	75	69	73	76	68	65	70	73
Dubuque, Iowa	79	76	74	69	62	[9]61	59	65	71	68	72	75	69
Duluth, Minn	78	76	72	82	64	73	70	72	76	74	71	75	74
Eastport, Me	79	76	74	76	82	79	77	84	79	(5)	(5)	(5)	.....
Elliott, Fort, Tex	79	69	67	62	52	65	58	64	(2)	73	62	64	.....
El Paso, Tex	52	45	36	29	32	42	52	56	68	66	56	56	49
Erie, Pa	85	78	81	73	68	69	68	70	69	71	74	82	74
Escanaba, Mich	80	79	79	78	69	72	71	79	83	82	74	78	77
Fort Smith, Ark	75	68	69	68	77	85	75	75	75	77	73	71	74
Frisco, Utah	72	56	67	54	27	25	33	47	34	52	61	56	49
Galveston, Tex	86	78	80	81	78	80	75	76	79	73	75	81	79
Grand Haven, Mich	81	80	80	74	75	75	82	76	74	77	74	80	77
Grant, Fort, Ariz	63	41	43	37	29	(5)	(5)	66	52	41	45	36	44
Greencastle, Ind.[10]	84	76	72	70	71	74	70	77	76	70	.....	.....	.....
Hatteras, N. C	84	74	77	80	80	82	86	87	81	82	74	84	81

[1] Station closed June 12, 1886.
[2] Record incomplete.
[3] Station closed May 7, 1886.
[4] Station closed December 8, 1886.
[5] No record.
[6] Station closed December 31, 1886.
[7] For 27 days.
[8] For 29 days.
[9] For 23 days.
[10] Station closed November 10, 1886.

Mean relative humidity at stations of the Signal Service, etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Helena, Mont	71	60	66	58	49	52	46	46	56	67	69	73	60
Huron, Dak	72	82	82	77	75	78	70	72	64	67	64	75	73
Indianapolis, Ind	86	76	70	66	70	69	65	72	70	66	67	77	71
Indianola, Tex.[1]	83	82	82	84	78	80	78	....	....	....	....	....	....
Jacksonville, Fla	79	78	78	74	69	77	80	82	82	80	76	83	78
Keeler, Cal	64	52	49	50	31	35	36	41	31	30	41	50	42
Keokuk, Iowa	87	77	76	72	72	70	60	64	70	66	71	80	72
Key West, Fla	83	84	77	76	73	75	76	74	75	76	70	81	77
Kitty Hawk, N.C.[2]	81	75	73	81	77	83	86	83	81	76	71	85	79
Knoxville, Tenn	81	71	66	72	75	83	80	81	77	81	79	78	77
La Crosse, Wis	76	73	73	70	68	74	75	79	80	73	78	76	74
Lamar, Mo	84	71	69	74	68	70	66	71	72	70	68	75	71
Las Animas, Colo	87	68	63	64	50	64	60	61	62	63	75	80	66
Leavenworth, Kans	76	72	71	71	74	75	66	67	67	69	65	74	71
Little Rock, Ark	83	72	73	69	76	87	79	77	78	74	74	75	76
Los Angeles, Cal	79	76	81	80	74	76	73	77	82	80	67	79	77
Louisville, Ky	84	72	65	66	66	76	78	70	70	64	69	72	71
Lynchburgh, Va	77	73	69	72	76	84	82	82	83	77	71	76	77
Mackinaw City, Mich	73	70	72	76	70	75	73	77	75	74	71	74	73
Macon, Fort, N. C.[2]	86	82	86	87	81	87	88	87	84	80	72	79	83
Maginnis, Fort, Mont	57	63	65	59	57	60	[3]52	54	56	60	66	65	60
Marquette, Mich	89	85	76	77	66	73	68	75	77	73	77	79	76
Memphis, Tenn	80	67	65	64	66	76	72	74	75	67	68	72	70
Milwaukee, Wis	88	85	81	78	69	75	69	76	74	69	68	81	76
Mobile, Ala	79	74	78	78	74	83	82	77	75	67	72	75	76
Montgomery, Ala	76	65	70	67	68	79	76	75	70	65	75	80	72
Montrose, Colo	72	67	65	58	38	35	39	52	50	58	66	67	56
Moorhead, Minn	92	87	81	70	64	69	74	71	69	70	73	76	75
Mount Washington, N. H	92	91	96	88	90	90	88	86	86	87	95	94	90
Nashville, Tenn	81	71	65	65	69	78	71	77	76	69	71	74	72
New Haven, Conn	78	74	72	72	70	74	76	77	79	75	71	76	74
New London, Conn	78	77	75	76	71	78	78	80	[3]80	78	74	81	77
New Orleans, La	80	68	76	76	74	82	80	77	81	72	74	74	76
New York City	78	74	73	73	71	78	70	72	74	70	69	75	73
Norfolk, Va	80	71	68	63	75	78	81	82	78	74	68	81	76
North Platte, Nebr	79	77	76	76	65	69	64	69	66	68	77	79	72
Olympia, Wash	88	88	82	77	76	73	76	76	82	90	89	94	83
Omaha, Nebr	83	78	80	69	65	69	58	66	70	65	67	78	71
Oswego, N. Y	87	81	78	73	71	70	73	75	75	77	74	83	76
Palestine, Tex	74	68	71	73	68	74	75	69	74	70	68	69	71
Pensacola, Fla	76	69	77	74	74	78	81	80	78	71	74	76	76
Philadelphia, Pa	74	72	68	74	73	73	73	77	[3]70	67	61	71	71
Pike's Peak, Colo	91	81	92	87	76	83	70	82	78	78	77	79	81
Pittsburg, Pa	82	81	79	72	73	75	73	77	78	72	71	78	76
Poplar River, Mont	88	81	81	70	66	62	52	51	68	76	72	84	71
Port Angeles, Wash	93	91	87	87	83	82	85	87	90	93	90	96	89
Port Huron, Mich	85	81	81	77	76	76	76	78	78	80	76	77	78
Portland, Me	82	78	74	71	76	76	79	74	78	74	77	79	77
Portland, Oregon	86	88	77	72	68	67	60	68	71	82	84	89	76
Prescott, Ariz	79	62	70	63	39	38	45	67	52	56	56	66	58
Red Bluff, Cal	83	72	63	67	57	35	[4]32	33	34	53	54	81	55
Rio Grande City, Tex	65	61	68	67	63	70	68	64	81	71	75	63	68
Rochester, N. Y	90	85	82	76	74	75	75	79	78	82	81	84	80
Roseburg, Oregon	86	85	72	68	65	62	61	61	65	83	88	87	73
Sacramento, Cal	90	82	71	76	69	60	60	58	59	70	65	83	70
Saint Louis, Mo	76	70	69	70	72	71	66	60	61	56	61	69	67
Saint Michael's Fort, Alaska[5]	84	87	87	83	85	84	....	....	....	....	....	....	....
Saint Paul, Minn	85	79	76	74	66	73	70	70	75	69	69	77	74
Saint Vincent, Minn	84	82	85	80	74	82	81	81	85	76	75	79	80
Salt Lake City, Utah	72	68	68	66	75	82	85	77	61	63	74	75	72
San Antonio, Tex	65	57	69	73	68	73	70	67	82	78	74	67	70
San Diego, Cal	74	71	77	76	79	81	78	79	84	82	70	82	78
Sandusky, Ohio	79	74	76	75	70	72	68	74	73	74	75	82	74
Sandy Hook, N. J.[6]	78	79	78	80	79	82	83	78	81	78	73	....	....
Sanford, Fla	77	76	76	74	72	81	85	81	80	80	72	78	78
San Francisco, Cal	79	75	69	72	72	74	77	82	76	77	67	82	75
Santa Fé, N. Mex	74	64	54	49	31	43	48	61	62	53	49	52	53
Savannah, Ga	78	71	76	75	70	79	82	83	83	77	70	77	77
Shaw, Fort, Mont.[7]	51	53	64	60	60	66	57	54	61	65	....	....	....
Shreveport, La	67	65	72	72	65	75	77	73	78	77	73	75	72
Sill, Fort, Ind. T	71	63	60	58	50	63	53	56	63	71	58	58	60
Sitka, Alaska	68	82	80	72	72	74	79	81	85	83	80	68	77
Smithville, N. C.[8]	78	76	80	84	79	84	86	87	83	78	....	....	....

[1] Station closed August 20, 1886.
[2] Station closed December 31, 1886.
[3] For 29 days.
[4] For 30 days.
[5] Station closed June 30, 1886.
[6] Station closed November 30, 1886.
[7] Station closed October 27, 1886.
[8] Station closed October 31, 1886.

Mean relative humidity at stations of the Signal Service, etc.—Continued.

Stations	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Spokane Falls, Wash	85	86	78	74	51	59	51	50	64	77	82	91	71
Springfield, Ill	74	70	70	68	67	68	61	70	72	67	66	73	69
Stanton, Fort, N. Mex	65	58	58	49	([1])	53	61	71	76	68	57	56	.....
Stockton, Fort, Tex.[2]	([1])	47	42	45	38	56	.....	.....	.....	.....	.....	.....	.....
Sully, Fort, Dak	73	73	76	69	59	62	56	55	54	57	71	77	65
Tatoosh Island, Wash	78	86	82	83	83	87	88	93	90	88	85	91	86
Thomas, Fort, Ariz	75	59	57	43	30	34	40	51	59	70	67	69	54
Toledo, Ohio	78	76	76	72	63	67	62	72	73	70	70	78	72
Totten, Fort, Dak	71	83	81	76	65	73	71	70	69	69	72	83	74
Unalashka, Alaska[3]	82	77	74	77	75	.....	.....	.....	.....	.....	.....	.....	.....
Valentine, Nebr	72	67	69	63	56	62	57	62	57	64	70	82	65
Vicksburg, Miss	79	67	68	68	66	81	78	76	78	70	70	70	72
Walla Walla, Wash	86	93	57	52	45	42	35	35	40	68	68	79	57
Washington, D. C	82	76	71	76	80	83	74	75	74	70	63	74	75
Wilmington, N. C	75	76	72	72	70	80	81	82	78	71	66	74	75
Winnemucca, Nev	58	53	50	47	29	33	28	20	22	58	61	64	44
Yankton, Dak	84	79	80	76	73	74	67	76	71	66	70	76	74
Yuma, Ariz	62	45	50	49	42	50	47	62	49	53	43	48	50

[1] No record. [2] Station closed June 30, 1886. [3] Station closed May 22, 1886.

APPENDIX No. 32.

Date of the first killing frost and the number of days prior to this date that the first light frost occurred, at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1886–'87.

Stations.	Dates.	No. of days.	Stations.	Dates.	No. of days.
Albany, N. Y	Oct. 17	26	Las Animas, Colo	Oct. 14	0
Alpena, Mich	Sept. 14	13	Leavenworth, Kans	Oct. 27	26
Assiniboine, Fort, Mont	Sept. 6	0	Little Rock, Ark	Nov. 7	10
Atlanta, Ga	Oct. 28	0	Louisville, Ky	Oct. 2	0
Atlantic City, N. J	Nov. 8	0	Lynchburgh, Va	Nov. 8	37
Augusta, Ga	Oct. 30	2	Mackinaw City, Mich	Sept. 21	0
Baltimore, Md	Oct. 17	15	Macon, Fort, N. C. [2]	Nov. 9	0
Benton, Fort, Mont. [1]	Sept. 6	0	Maginnis, Fort, Mont	Sept. 6	0
Bismarck, Dak	Sept. 18	6	Marquette, Mich	Sept. 21	7
Block Island, R. I	Nov. 14	6	Memphis, Tenn	Oct. 28	26
Boston, Mass	Oct. 17	26	Milwaukee, Wis	Oct. 1	3
Brownsville, Tex	Dec. 5	0	Mobile, Ala	Nov. 18	21
Buffalo, N. Y	Oct. 16	0	Montgomery, Ala	Oct. 29	1
Buford, Fort, Dak	Sept. 16	0	Moorhead, Minn	Sept. 12	12
Cairo, Ill	Oct. 28	26	Mount Washington, N. H	July 13	0
Cape Henry, Va [2]	Nov. 14	5	Nantucket, Mass	Nov. 8	0
Cedar Keys, Fla	Dec. 7	0	Nashville, Tenn	Oct. 28	26
Charleston, S. C	Nov. 8	0	New Haven, Conn	Oct. 2	11
Charlotte, N. C	Oct. 30	2	New London, Conn	Oct. 17	26
Chattanooga, Tenn	Oct. 30	2	New Orleans, La	Nov. 18	0
Cheyenne, Wyo	Sept. 27	2	New York City	Nov. 7	21
Chicago, Ill	Nov. 8	56	Norfolk, Va	Nov. 8	9
Chincoteague, Va	Nov. 8	0	North Platte, Nebr	Oct. 20	31
Cincinnati, Ohio	Oct. 31	29	Omaha, Nebr	Oct. 1	0
Cleveland, Ohio	Nov. 6	34	Oswego, N. Y	Oct. 17	14
Columbus, Ohio	Oct. 2	0	Palestine, Tex	Nov. 12	15
Concordia, Kans	Oct. 26	27	Pensacola, Fla	Nov. 18	21
Custer, Fort, Mont	Sept. 29	0	Philadelphia, Pa	Nov. 8	37
Davenport, Iowa	Oct. 1	14	Pike's Peak, Colo	Sept. 2	13
Davis, Fort, Tex	Nov. 13	10	Pittsburgh, Pa	Nov. 7	35
Deadwood, Dak	Sept. 25	0	Poplar River, Mont	Sept. 16	8
Denver, Colo	Sept. 28	11	Port Huron, Mich	Oct. 2	19
Des Moines, Iowa	Oct. 1	14	Portland, Me	Oct. 3	31
Detroit, Mich	Oct. 2	13	Rio Grande City, Tex	Dec. 5	17
Dodge City, Kans	Oct. 26	0	Rochester, N. Y	Oct. 16	13
Dubuque, Iowa	Sept. 29	16	Saint Louis, Mo	Oct. 28	27
Duluth, Minn	Sept. 13	13	Saint Paul, Minn	Oct. 1	3
Eastport, Me	Oct. 17	26	Saint Vincent, Minn	Sept. 13	13
Elliott, Fort, Tex	Nov. 6	11	San Antonio, Tex	Nov. 18	0
Erie, Pa	Nov. 15	43	Sandusky, Ohio	Nov. 7	36
Escanaba, Mich	Oct. 1	17	Sandy Hook, N. J [5]	Nov. 5	0
Fort Smith, Ark	Oct. 28	1	Sanford, Fla	Dec. 7	0
Galveston, Tex	Dec. 5	17	Savannah, Ga	Nov. 27	30
Grand Haven, Mich	Oct. 26	55	Shaw, Fort, Mont. [6]	Oct. 12	0
Green Bay, Wis	Oct. 1	30	Shreveport, La	Nov. 17	10
Greencastle, Ind. [3]	Oct. 1	2	Sill, Fort, Ind. T	Oct. 27	0
Hatteras, N. C	Dec. 9	10	Smithville, N. C. [7]	([8])	0
Helena, Mont	Sept. 5	0	Springfield, Ill	Oct. 2	1
Huron, Dak	Aug. 31	0	Stanton, Fort, N. Mex	Sept. 29	0
Indianapolis, Ind	Oct. 1	1	Sully, Fort, Dak	Sept. 30	0
Jacksonville, Fla	Dec. 6	38	Toledo, Ohio	Oct. 16	14
Keoknk, Iowa	Oct. 1	2	Totten, Fort, Dak	Aug. 31	0
Key West, Fla	([4])	0	Valentine, Nebr	Oct. 1	0
Kitty Hawk, N. C. [2]	Nov. 8	0	Vicksburg, Miss	Oct. 28	25
Knoxville, Tenn	Oct. 30	0	Washington City	Nov. 5	33
La Crosse, Wis	Oct. 1	17	Wilmington, N. C	Nov. 8	0
Lamar, Mo	Oct. 27	26	Yankton, Dak	Oct. 1	31

[1] Station closed December 8, 1886.
[2] Station closed December 31, 1886.
[3] Station closed November 10, 1886.
[4] No frost observed.
[5] Station closed November 30, 1886.
[6] Station closed October 27, 1886.
[7] Station closed October 31, 1886.
[8] No frost prior to closing of station.

APPENDIX No. 33.

Date of the last killing frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1886-'87.

Stations.	Dates.
Abilene, Tex	Feb. 24
Albany, N. Y	Apr. 18
Alpena, Mich	Apr. 8
Assiniboine, Fort, Mont	May 16
Atlanta, Ga	Mar. 30
Atlantic City, N. J	Apr. 1
Augusta, Ga	Apr. 2
Baltimore, Md	Mar. 30
Bismarck, Dak	May 17
Block Island, R. I	Mar. 8
Boston, Mass	Apr. 19
Brownsville, Tex	Jan. 10
Buffalo, N. Y	Apr. 17
Buford, Fort, Dak	May 17
Cairo, Ill	Apr. 19
Cedar Keys, Fla	Dec. 7
Charleston, S. C	Apr. 2
Charlotte, N. C	Mar. 29
Chattanooga, Tenn	Mar. 30
Cheyenne, Wyo	Apr. 26
Chicago, Ill	Apr. 25
Chincoteague, Va	Apr. 20
Cincinnati, Ohio	Apr. 19
Cleveland, Ohio	Apr. 2
Columbus, Ohio	Apr. 20
Concordia, Kans	Apr. 23
Custer, Fort, Mont	Apr. 20
Davenport, Iowa	Apr. 26
Davis, Fort, Tex	Mar. 28
Deadwood, Dak	Apr. 24
Denver, Colo	May 5
Des Moines, Iowa	Apr. 25
Detroit, Mich	Apr. 1
Dodge City, Kans	Apr. 23
Dubuque, Iowa	Apr. 26
Duluth, Minn	Apr. 7
Eastport, Me	Apr. 20
Elliott, Fort, Tex	Apr. 23
Erie, Pa	Apr. 30
Escanaba, Mich	May 4
Fort Smith, Ark	Apr. 5
Galveston, Tex	Jan. 10
Grand Haven, Mich	Apr. 26
Green Bay, Wis	Apr. 27
Hatteras, N. C	Jan. 13
Helena, Mont	May 22
Huron, Dak	Apr. 25
Indianapolis, Ind	Apr. 19
Jacksonville, Fla	Mar. 19
Keokuk, Iowa	Apr. 5
Key West, Fla	([1])
Knoxville, Tenn	Apr. 6
La Crosse, Wis	Apr. 26
Lamar, Mo	Apr. 24
Las Animas, Colo	May 3
Leavenworth, Kans	Apr. 5
Little Rock, Ark	Mar. 29
Louisville, Ky	Apr. 24
Lynchburgh, Va	Apr. 20
Mackinaw City, Mich	May 4
Maginnis, Fort, Mont	Apr. 23
Manchester, N. H	Mar. 8
Marquette, Mich	May 4
Memphis, Tenn	Mar. 29
Milwaukee, Wis	Apr. 26
Mobile, Ala	Mar. 22
Montgomery, Ala	Mar. 29
Moorhead, Minn	May 17
Mount Washington, N. H	May 14
Nantucket, Mass	Apr. 6
Nashville, Tenn	Apr. 6
New Haven, Conn	Apr. 9
New London, Conn	Apr. 6
New Orleans, La	Jan. 11
New York, N. Y	Apr. 19
Norfolk, Va	Apr. 20
Northfield, Vt	May 14
North Platte, Nebr	Apr. 23
Omaha, Nebr	Apr. 25
Oswego, N. Y	Apr. 22
Palestine, Tex	Mar. 28
Pensacola, Fla	Feb. 28
Philadelphia, Pa	Mar. 2
Pike's Peak, Colo	May 28
Pittsburgh, Pa	Mar. 30
Poplar River, Mont	May 16
Port Huron, Mich	Apr. 19
Portland, Me	Apr. 1
Rio Grande City, Tex	Jan. 10
Rochester, N. Y	Apr. 28
Saint Louis, Mo	Mar. 28
Saint Paul, Minn	Apr. 27
Saint Vincent, Minn	June 4
San Antonio, Tex	Jan. 10
Sandusky, Ohio	Apr. 8
Sanford, Fla	Jan. 2
Savannah, Ga	Mar. 29
Shreveport, La	Jan. 12
Sill, Fort, Ind. T	Feb. 21
Springfield, Ill	Apr. 5
Stanton, Fort, N. Mex	May 5
Toledo, Ohio	Apr. 2
Totten, Fort, Dak	June 4
Valentine, Nebr	May 3
Vicksburg, Miss	Jan. 27
Washington, D. C	Apr. 20
Wilmington, N. C	Feb. 28
Yankton, Dak	May 3

[1] No frost observed.

APPENDIX No. 34.

Date of the first snowfall at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1886–'87.

Stations.	Dates.	Stations.	Dates.
Abilene, Tex	Dec. 31	Las Animas, Colo	Nov. 8
Albany, N. Y.	Nov. 6	Leavenworth, Kans	Nov. 17
Alpena, Mich	Oct. 1	Little Rock, Ark	Nov. 17
Assiniboine, Fort, Mont	Oct. 14	Louisville, Ky	Nov. 6
Atlanta, Ga	Dec. 3	Lynchburgh, Va	Dec. 4
Atlantic City, N. J	Dec. 4	Mackinaw City, Mich	Sept. 30
Augusta, Ga	Dec. 5	Macon, Fort, N. C.[3]	([5])
Baltimore, Md	Nov. 13	Maginnis, Fort, Mont	Sept. 16
Benton, Fort, Mont.[1]	Sept. 5	Marquette, Mich	Sept. 30
Bismarck, Dak	Sept. 18	Memphis, Tenn	Nov. 17
Block Island, R. I	Nov. 8	Milwaukee, Wis	Nov. 6
Boston, Mass	Nov. 7	Mobile, Ala	Dec. 5
Brownsville, Tex	([2])	Montgomery, Ala	Dec. 5
Buffalo, N. Y	Oct. 1	Moorhead, Minn	Nov. 5
Buford, Fort, Dak	Sept. 17	Mount Washington, N. H	July 23
Cairo, Ill	Nov. 6	Nantucket, Mass	Nov. 8
Cape Henry, Va.[3]	Dec. 4	Nashville, Tenn	Nov. 17
Cedar Keys, Fla	([2])	New Haven, Conn	Nov. 7
Charleston, S. C	Dec. 6	New London, Conn	Nov. 7
Charlotte, N. C	Nov. 9	New Orleans, La	([2])
Chattanooga, Tenn	Nov. 9	New York, N. Y	Nov. 7
Cheyenne, Wyo	Sept. 16	Norfolk, Va	Dec. 4
Chicago, Ill	Nov. 17	North Platte, Nebr	Nov. 5
Chincoteague, Va	Nov. 7	Omaha, Nebr	Nov. 16
Cincinnati, Ohio	Nov. 6	Oswego, N. Y	Oct. 17
Cleveland, Ohio	Nov. 6	Palestine, Tex	Nov. 17
Columbus, Ohio	Oct. 27	Pensacola, Fla	Dec. 5
Concordia, Kans	Nov. 5	Philadelphia, Pa	Nov. 6
Custer, Fort, Mont	Sept. 16	Pike's Peak, Colo	([6])
Davenport, Iowa	Nov. 17	Pittsburgh, Pa	Nov. 6
Davis, Fort, Tex	([2])	Poplar River, Mont	Sept. 17
Deadwood, Dak	Oct. 24	Port Huron, Mich	Nov. 6
Denver, Colo	Nov. 1	Portland, Me	Oct. 16
Des Moines, Iowa	Nov. 16	Rio Grande City, Tex	([2])
Detroit, Mich	Nov. 9	Rochester, N. Y	Oct. 17
Dodge City, Kans	Nov. 11	Saint Louis, Mo	Nov. 5
Dubuque, Iowa	Nov. 16	Saint Paul, Minn	Nov. 16
Duluth, Minn	Sept. 30	Saint Vincent, Minn	Sept. 29
Eastport, Me	Nov. 13	San Antonia, Tex	([2])
Elliott, Fort, Tex	Nov. 16	Sandusky, Ohio	Nov. 6
Erie, Pa	Nov. 6	Sandy Hook, N. J.[7]	([5])
Escanaba, Mich	Sept. 30	Sanford, Fla	([2])
Fort Smith, Ark	Nov. 17	Savannah, Ga	Dec. 6
Galveston, Tex	([2])	Shaw, Fort, Mont.[8]	Sept. 5
Grand Haven, Mich	Nov. 7	Shreveport, La	Nov. 17
Green Bay, Wis	Nov. 16	Sill, Fort, Ind. T	Dec. 4
Greencastle, Ind.[4]	Nov. 5	Smithville, N. C.[9]	([5])
Hatteras, N. C	Mar. 18	Springfield, Ill	Nov. 26
Helena, Mont	Sept. 4	Stanton, Fort, N. Mex	Nov. 17
Huron, Dak	Nov. 15	Sully, Fort, Dak	Nov. 15
Indianapolis, Ind	Oct. 27	Toledo, Ohio	Nov. 6
Jacksonville, Fla	([2])	Totten, Fort, Dak	Oct. 20
Keokuk, Iowa	Nov. 17	Valentine, Nebr	Nov. 15
Key West, Fla	([2])	Vicksburg, Miss	Dec. 4
Kitty Hawk, N. C.[3]	Dec. 4	Washington City	Nov. 25
Knoxville, Tenn	Dec. 4	Wilmington, N. C	Dec. 6
La Crosse, Wis	Nov. 16	Yankton, Dak	Nov. 15
Lamar, Mo	Nov. 12		

[1] Station closed December 8, 1886.
[2] No snow.
[3] Station closed December 31, 1886.
[4] Station closed November 10, 1886.
[5] No snow up to closing of station.
[6] Snow every month in the year.
[7] Station closed November 30, 1886.
[8] Station closed October 27, 1886.
[9] Station closed October 31, 1886.

APPENDIX No. 35.

Date of the last snowfall at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1886–'87.

Stations.	Dates.	Stations.	Dates.
Abilene, Tex	Feb. 3	Las Animas, Colo	Apr. 17
Albany, N. Y	Apr. 19	Leavenworth, Kans	Mar. 28
Alpena, Mich	Apr. 5	Little Rock, Ark	Jan. 4
Assiniboine, Fort, Mont	May 20	Louisville, Ky	Mar. 31
Atlanta, Ga	Jan. 7	Lynchburgh, Va	June 11
Atlantic City, N. J	Apr. 2	Mackinaw City, Mich	Apr. 23
Augusta, Ga	Jan. 7	Maginnis, Fort, Mont	June 2
Baltimore, Md	Apr. 2	Manchester, N. H	Apr. 18
Bismarck, Dak	May 2	Marquette, Mich	Apr. 25
Block Island, R. I	Apr. 2	Memphis, Tenn	Jan. 4
Boston, Mass	Apr. 2	Milwaukee, Wis	Apr. 4
Brownsville, Tex	(1)	Mobile, Ala	Dec. 5
Buffalo, N. Y	Apr. 18	Montgomery, Ala	Jan. 5
Buford, Fort, Dak	Apr. 16	Moorhead, Minn	May 2
Cairo, Ill	Mar. 28	Mount Washington, N. H	May 29
Cedar Keys, Fla	(1)	Nantucket, Mass	Apr. 18
Charleston, S. C	Dec. 6	Nashville, Tenn	Mar. 29
Charlotte, N. C	Jan. 17	New Haven, Conn	Apr. 18
Chattanooga, Tenn	Mar. 29	New London, Conn	Apr. 18
Cheyenne, Wyo	May 1	New Orleans, La	(1)
Chicago, Ill	Apr. 24	New York City	Apr. 18
Chincoteague, Va	Apr. 1	Norfolk, Va	Apr. 2
Cincinnati, Ohio	Apr. 18	Northfield, Vt	Apr. 19
Cleveland, Ohio	Apr. 18	North Platte, Nebr	Apr. 22
Columbus, Ohio	Apr. 18	Omaha, Nebr	Mar. 28
Concordia, Kans	Mar. 27	Oswego, N. Y	Apr. 18
Custer, Fort, Mont	Apr. 18	Palestine, Tex	Jan. 9
Davenport, Iowa	Apr. 24	Pensacola, Fla	Jan. 5
Davis, Fort, Tex	Mar. 27	Philadelphia, Pa	Apr. 2
Deadwood, Dak	May 1	Pike's Peak, Colo	(2)
Denver, Colo	May 1	Pittsburgh, Pa	Apr. 18
Des Moines, Iowa	Apr. 22	Poplar River, Mont	Apr. 12
Detroit, Mich	Apr. 7	Port Huron, Mich	Apr. 26
Dodge City, Kans	Mar. 5	Portland, Me	Apr. 26
Dubuque, Iowa	Apr. 24	Rio Grande City, Tex	(1)
Duluth, Minn	Apr. 22	Rochester, N. Y	Apr. 18
Eastport, Me	Apr. 26	Saint Louis, Mo	Apr. 18
Elliott, Fort, Tex	Jan. 8	Saint Paul, Minn	Apr. 24
Erie, Pa	Apr. 4	Saint Vincent, Minn	May 25
Escanaba, Mich	Apr. 25	San Antonio, Tex	(1)
Fort Smith, Ark	Mar. 23	Sandusky, Ohio	Apr. 21
Galveston, Tex	(1)	Sanford, Fla	(1)
Grand Haven, Mich	Apr. 23	Savannah, Ga	Dec. 6
Green Bay, Wis	Apr. 23	Shreveport, La	Jan. 5
Hatteras, N. C	Mar. 18	Sill, Fort, Ind. T	Feb. 5
Helena, Mont	May 20	Springfield, Ill	Apr. 18
Huron, Dak	Apr. 24	Stanton, Fort, N. Mex	Mar. 27
Indianapolis, Ind	Apr. 17	Toledo, Ohio	Apr. 18
Jacksonville, Fla	(1)	Totten, Fort, Dak	May 2
Keokuk, Iowa	Apr. 17	Valentine, Nebr	Apr. 23
Key West, Fla	(1)	Vicksburg, Miss	Jan. 5
Knoxville, Tenn	Mar. 17	Washington City	Apr. 1
La Crosse, Wis	Apr. 23	Wilmington, N. C	Dec. 6
Lamar, Mo	Mar. 31	Yankton, Dak	Apr. 3

[1] No snow observed. [2] Every month of year.

APPENDIX No. 36.

Average hourly velocity of the wind (in miles) at stations of the Signal Service, U. S. Army, for each month and the year 1886.

[The average hourly velocity is obtained by dividing the total monthly movement by 24 times the number of days in the month.]

Districts and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Abilene, Tex	10.9	9.7	12.2	12.2	10.6	7.9	6.0	10.6	7.5	10.9	11.1	12.7	10.2
Albany, N. Y	7.3	9.0	7.6	5.0	5.8	6.1	4.4	5.0	5.3	5.7	7.3	6.5	6.2
Alpena, Mich	10.2	10.1	9.9	7.2	9.0	8.0	6.8	7.5	9.1	8.5	10.5	9.2	8.8
Apache, Fort, Ariz	5.0	6.2	7.5	8.8	8.0	7.7	6.0	5.7	6.0	6.9	5.7	4.8	6.5
Assinaboine, Fort, Mont	9.4	14.0	10.5	11.7	11.3	10.0	10.5	9.2	10.6	11.0	14.3	10.7	11.0
Atlanta, Ga	11.9	11.6	11.5	10.9	9.5	8.2	7.1	7.0	8.3	8.8	10.1	9.8	9.6
Atlantic City, N. J	10.9	11.2	10.7	10.6	9.6	7.8	5.6	7.3	9.0	8.8	8.3	9.4	9.1
Augusta, Ga	5.7	4.3	5.1	4.5	3.7	3.5	2.7	3.4	3.9	3.4	3.3	3.7	3.9
Baltimore, Md	6.4	7.2	7.9	5.7	5.7	5.3	4.7	4.9	4.8	5.1	6.5	5.4	5.8
Behring's Isl'd, Behring Sea[1]	15.4	14.3	14.4	15.4	.....	.....	.....	.....	.....	.....	.....	.....	.....
Benton, Fort, Mont[2]	2.1	4.5	2.4	6.1	3.9	3.9	2.8	3.5	5.7	.....	.....	.....	.....
Bidwell, Fort, Cal	5.0	4.6	5.6	5.7	5.3	5.5	5.1	4.6	4.4	4.2	4.1	6.4	5.0
Bismarck, Dak	5.4	7.5	6.7	9.6	7.8	6.8	7.0	7.4	8.8	7.4	8.7	4.7	7.3
Block Island, R. I	19.0	20.0	16.2	12.4	14.2	9.6	10.0	11.2	12.4	15.3	13.9	18.3	14.4
Boisé City, Idaho	3.9	3.7	6.3	6.3	4.2	4.6	4.4	3.2	3.3	3.2	3.4	3.6	4.2
Boston, Mass	12.5	15.8	14.3	10.6	11.6	10.0	9.4	9.6	10.7	11.5	11.9	13.4	11.8
Bridger, Fort, Wyo	12.6	10.7	11.0	10.3	8.5	7.2	6.7	6.1	9.2	7.0	11.2	13.0	9.4
Brownsville, Tex	8.1	9.0	8.8	9.2	8.9	5.7	6.2	6.4	7.8	5.8	8.8	7.1	7.6
Buffalo, N. Y	12.3	13.8	11.6	9.6	8.9	8.1	7.1	7.7	10.1	10.8	16.1	12.9	10.8
Buford, Fort, Dak	8.1	10.2	9.2	10.1	10.3	8.1	8.9	8.4	11.0	7.2	9.3	8.0	9.1
Cairo, Ill	8.7	8.8	11.4	8.7	7.9	6.0	4.5	5.8	6.1	6.0	8.5	9.2	7.6
Canby, Fort, Wash	15.9	11.5	11.4	9.9	10.0	6.8	8.8	8.2	10.2	9.0	10.4	19.0	10.9
Cape Henry, Va[3]	14.0	15.2	15.2	13.5	14.5	11.6	9.6	12.7	13.4	13.3	13.0	15.0	13.4
Cape Mendocino, Cal[3]	21.2	19.2	22.0	21.6	26.8	22.8	22.5	16.9	15.8	16.0	14.7	25.3	20.4
Cedar Keys, Fla	9.3	8.2	9.8	10.2	8.7	9.4	9.4	8.2	9.2	10.0	7.6	8.1	9.0
Charleston, S. C	8.0	6.8	7.5	8.4	8.4	8.2	6.6	7.4	7.6	7.6	6.8	6.8	7.5
Charlotte, N. C	6.2	6.1	6.9	6.2	5.4	4.5	3.8	4.2	4.5	4.2	3.9	3.5	5.0
Chattanooga, Tenn	6.5	7.0	7.0	6.4	5.9	4.8	4.2	4.4	3.9	4.5	6.1	5.9	5.6
Cheyenne, Wyo	13.7	13.6	12.7	11.8	8.4	8.0	7.3	6.5	7.1	8.4	(4)	(4)	.....
Chicago, Ill	10.1	10.3	9.2	8.5	7.7	6.8	7.4	7.3	7.7	7.7	9.6	6.9	8.3
Chincoteague, Va	15.1	16.1	15.6	11.5	13.0	9.1	7.8	9.3	9.9	10.2	12.2	14.2	12.0
Cincinnati, Ohio	8.1	8.6	9.7	7.4	6.6	5.8	5.0	5.3	5.9	5.7	8.8	8.2	7.1
Cleveland, Ohio	11.3	12.6	10.1	9.3	7.3	6.7	6.2	7.2	9.0	8.9	11.6	9.7	9.2
Columbus, Ohio	8.1	8.3	9.5	7.6	6.5	5.1	4.8	5.3	6.1	5.4	9.2	8.0	7.0
Concordia, Kans	10.6	10.1	10.1	11.6	8.3	7.5	6.3	6.9	8.6	8.6	9.2	7.9	8.8
Custer, Fort, Mont	(5)	9.3	7.6	8.1	6.7	6.1	6.1	5.6	6.5	6.1	7.4	7.1	.....
Davenport, Iowa	9.1	10.3	8.5	9.2	6.1	6.2	6.2	6.2	7.7	7.3	9.3	7.1	7.6
Davis, Fort, Tex	8.7	7.1	8.4	8.2	7.6	6.7	5.7	5.8	5.5	5.8	7.9	8.1	7.1
Deadwood, Dak	3.4	3.4	3.2	3.8	2.9	2.6	3.4	2.3	2.2	3.5	5.3	4.8	3.4
Denver, Colo	7.8	10.0	8.0	8.7	7.5	6.9	6.9	6.6	6.5	7.0	9.3	8.9	7.8
Des Moines, Iowa	6.1	5.9	4.5	5.0	4.0	4.5	4.5	4.3	5.7	5.1	7.0	5.7	5.2
Detroit, Mich	10.1	12.2	10.3	10.5	8.2	7.8	7.5	7.6	8.4	6.9	9.2	8.4	8.9
Dodge City, Kans	11.6	10.9	13.0	15.3	11.2	10.8	7.2	10.0	10.5	10.1	8.4	8.6	10.6
Dubuque, Iowa	4.5	5.8	5.7	5.3	4.3	3.6	4.3	4.4	5.3	4.4	5.7	4.0	4.8
Duluth, Minn	9.6	9.1	7.1	6.5	6.7	5.5	5.6	6.0	6.4	5.6	8.0	5.6	6.8
Eastport, Me	11.7	13.0	9.6	7.3	6.1	5.4	4.1	5.5	7.5	(4)	(4)	(4)	.....
Elliott, Fort, Tex	13.5	12.6	15.2	15.4	10.6	10.8	9.3	8.7	10.7	10.9	10.8	11.0	11.6
El Paso, Tex	4.9	4.4	5.6	6.5	4.1	3.5	3.1	4.7	4.3	3.7	4.5	4.2	4.5
Erie, Pa	12.5	13.2	9.9	9.9	8.0	7.4	6.2	7.5	9.6	8.8	13.9	11.2	9.8
Escanaba, Mich	9.6	9.7	9.0	6.5	7.4	6.8	6.9	7.2	7.4	8.1	9.3	8.2	8.0
Fort Smith, Ark	7.4	6.2	7.6	5.8	3.6	3.7	3.6	3.3	4.4	3.9	4.9	6.1	5.0
Frisco, Utah	11.1	7.4	10.7	12.7	13.8	11.6	10.9	8.4	9.4	12.7	7.9	8.1	9.6
Galveston, Tex	12.2	11.9	12.0	11.2	11.3	9.5	8.0	9.3	12.4	9.6	9.0	8.3	10.4
Grand Haven, Mich	11.2	12.0	9.8	10.8	10.2	8.1	7.8	8.3	11.5	11.0	14.7	11.6	10.6
Grant, Fort, Ariz	6.7	8.0	8.3	8.1	7.6	(4)	(4)	6.9	7.4	7.3	7.3	6.6	7.3

[1] Station closed May 7, 1886.
[2] Station closed December 8, 1886.
[3] Station closed December 31, 1886.
[4] No record.
[5] Incomplete.

Average hourly velocity of the wind (in miles) at stations of the Signal Service, U. S. Army, etc.—Continued.

Districts and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Greencastle, Ind[1]	7.6	9.6	8.6	8.3	5.7	4.5	3.8	4.3	4.5	4.7	.....	.....	.....
Hatteras, N. C	14.7	12.9	13.7	10.8	11.0	9.9	8.4	9.6	7.2	8.1	10.6	12.4	10.8
Helena, Mont	6.1	10.4	7.8	8.4	8.4	8.1	7.0	7.2	7.4	6.7	7.3	6.3	7.6
Huron, Dak	9.0	10.1	10.4	10.8	7.5	7.0	8.2	7.7	8.0	9.2	9.8	7.6	8.8
Indianapolis, Ind	7.1	7.7	7.0	5.8	4.7	4.4	3.9	4.1	4.6	4.2	6.6	6.3	5.5
Indianola, Tex[2]	16.4	16.6	16.0	14.9	13.8	11.2	10.5	.....	.....	.....	.....	.....	.....
Jacksonville, Fla	7.9	5.8	7.0	7.7	6.2	6.5	6.0	5.5	5.1	6.1	5.1	5.2	6.2
Keeler, Cal	3.9	5.2	6.9	8.9	6.9	6.4	5.3	6.0	5.2	7.4	4.8	2.6	5.8
Keokuk, Iowa	8.7	9.4	9.5	10.0	6.1	6.3	5.7	7.1	8.8	7.5	10.2	7.7	8.1
Key West, Fla	11.6	10.5	11.3	9.3	9.4	10.3	8.7	11.4	9.9	13.3	13.3	11.0	10.8
Kitty Hawk, N. C[3]	16.1	15.6	16.6	14.1	15.4	14.1	11.4	14.3	15.1	14.3	13.7	14.8	14.8
Knoxville, Tenn	6.0	6.0	7.6	5.6	5.4	4.4	3.7	3.5	3.5	3.0	5.9	5.2	5.0
La Crosse, Wis	7.4	9.3	8.5	8.1	6.8	7.2	6.3	6.0	8.0	8.1	8.3	7.3	7.6
Lamar, Mo	11.3	10.0	13.7	11.5	8.8	7.6	6.8	8.3	9.0	8.0	11.2	10.0	9.7
Las Animas, Colo	7.1	8.2	10.1	10.5	8.3	8.1	6.7	6.0	5.9	6.0	6.9	5.4	7.4
Leavenworth, Kans	7.3	8.1	8.6	8.3	5.4	4.9	4.6	6.4	7.6	6.5	8.1	7.4	6.9
Little Rock, Ark	6.2	6.0	7.8	6.6	6.0	5.0	3.7	4.1	4.7	2.9	3.7	6.6	5.3
Los Angeles, Cal	7.0	6.0	6.1	6.3	5.8	5.2	5.4	5.0	4.7	5.5	6.2	4.9	5.7
Louisville, Ky	9.1	8.8	8.9	7.1	6.0	5.8	4.7	5.1	5.2	4.4	7.3	8.2	6.7
Lynchburgh, Va	4.2	5.1	5.5	4.0	3.9	3.4	3.1	2.4	2.4	2.6	3.6	2.4	3.6
Mackinaw City, Mich	11.0	10.5	10.9	7.9	8.9	7.0	7.3	7.5	10.4	8.7	14.2	13.0	9.8
Macon, Fort, N. C[3]	16.9	14.6	15.9	15.2	15.8	15.8	14.3	15.0	13.4	12.4	11.9	9.6	14.2
Maginnis, Fort, Mont	12.2	14.1	9.3	11.4	11.1	8.1	5.9	5.3	10.0	10.3	16.0	11.9	10.5
Marquette, Mich	11.2	11.0	8.5	6.9	8.2	7.1	7.3	8.0	9.9	10.4	11.6	11.8	9.3
Memphis, Tenn	6.6	7.2	8.0	7.3	6.9	5.4	4.3	5.4	6.0	5.4	6.9	8.0	6.4
Milwaukee, Wis	12.5	13.5	12.7	10.3	9.4	7.8	8.4	8.9	10.5	10.0	13.2	10.9	10.7
Mobile, Ala	9.2	9.0	8.7	8.4	8.2	6.8	5.8	6.3	6.9	7.6	8.1	7.4	7.5
Montgomery, Ala	7.3	6.6	6.3	6.6	5.1	4.8	4.0	4.1	5.4	5.1	5.1	5.0	5.4
Montrose, Colo	5.5	5.7	7.3	7.5	8.5	8.3	7.8	5.8	6.1	6.0	4.6	4.3	6.4
Moorhead, Minn	11.0	14.8	12.7	14.6	11.1	8.5	8.7	8.4	10.4	12.0	11.8	9.6	11.3
Mount Washington, N. H	33.7	46.3	35.2	25.9	29.7	27.6	31.7	27.9	35.2	29.2	31.9	37.5	32.4
Nashville, Tenn	7.2	6.8	8.4	7.3	6.4	4.6	4.5	4.9	4.7	4.5	6.6	6.9	6.1
New Haven, Conn	10.5	10.7	9.7	6.9	7.7	5.8	5.2	5.6	6.3	7.7	7.9	9.8	7.6
New London, Conn	7.6	9.0	7.0	6.6	7.2	5.6	5.4	5.6	6.5	6.5	7.8	7.4	6.8
New Orleans, La	8.3	8.6	8.2	8.4	6.2	5.3	5.1	6.7	7.7	8.1	8.2	8.0	7.4
New York City	12.5	16.6	14.5	8.6	8.6	7.2	6.0	6.8	6.4	8.1	9.8	10.0	9.6
Norfolk, Va	7.0	7.5	8.2	6.2	6.4	5.0	4.3	4.4	5.9	5.6	7.4	6.6	6.2
North Platte, Nebr	7.7	8.1	8.4	11.1	8.2	8.8	8.5	8.2	8.1	9.0	9.6	7.8	8.6
Olympia, Wash	5.1	4.2	5.0	4.3	4.0	4.2	3.7	3.4	3.5	2.9	3.7	4.5	4.0
Omaha, Nebr	11.8	8.8	8.7	8.8	5.7	5.5	5.4	5.8	7.7	7.5	10.0	7.7	7.6
Oswego, N. Y	13.3	13.5	12.3	9.8	9.0	8.7	7.4	8.6	9.8	10.5	15.5	12.8	10.9
Palestine, Tex	10.7	10.2	10.1	8.4	8.6	7.6	6.8	7.3	8.4	7.6	9.9	9.9	8.8
Pensacola, Fla	7.8	7.5	7.4	8.2	8.8	7.3	5.8	6.5	7.8	7.4	6.8	6.2	7.3
Philadelphia, Pa	12.1	14.2	12.0	9.1	9.8	8.2	7.0	7.7	8.3	9.4	10.9	11.9	10.0
Pike's Peak, Colo	25.5	26.7	27.1	20.8	19.8	14.0	12.0	9.7	16.4	20.7	29.0	31.8	21.1
Pittsburgh, Pa	7.5	8.3	7.5	5.6	5.3	4.9	4.0	4.6	5.4	5.2	8.6	7.4	6.2
Poplar River, Mont	5.3	7.5	7.6	9.9	9.2	7.9	8.7	9.0	10.0	6.8	7.8	5.8	8.0
Port Angeles, Wash	4.4	3.3	4.2	4.4	5.1	5.5	5.2	4.6	3.9	3.3	4.1	3.2	4.3
Port Huron, Mich	9.8	12.3	10.6	9.5	8.2	7.4	6.9	7.3	8.0	8.6	14.2	11.1	9.5
Portland, Me	8.3	10.4	8.8	7.5	7.5	7.1	5.9	6.1	7.3	6.3	8.6	8.9	7.6
Portland, Oreg	4.9	4.6	5.6	5.6	5.6	4.9	5.2	4.9	5.6	4.2	3.7	5.4	5.0
Prescott, Ariz	7.0	5.9	7.0	8.5	8.0	6.9	6.1	5.1	6.0	6.7	5.4	3.0	6.3
Red Bluff, Cal	7.6	5.1	7.7	8.7	7.0	7.9	6.0	5.0	.....	4.1	.....	.....	.....
Rio Grande City, Tex	4.7	4.9	6.2	8.1	7.3	5.4	6.5	6.6	5.2	3.2	5.9	4.0	5.7
Rochester, N. Y	13.1	13.6	12.2	10.4	10.1	8.6	7.3	8.8	10.0	11.4	14.3	12.0	11.0
Roseburg, Oregon	1.7	1.5	2.3	2.9	2.2	2.4	2.6	2.7	3.1	2.2	2.4	2.8	2.2
Sacramento, Cal	7.2	6.0	8.8	8.0	7.8	8.1	6.5	5.7	4.7	4.8	5.1	4.4	6.4
Saint Louis, Mo	12.2	13.2	13.4	11.6	9.3	9.2	7.8	9.3	10.9	8.7	12.2	11.3	10.8
Saint Michael's, Ft., Alaska[4]	15.8	16.2	15.3	12.4	15.5	9.5	.....	.....	.....	.....	.....	.....	.....
Saint Paul, Minn	6.2	7.1	5.9	7.1	6.0	5.9	5.5	6.5	7.5	6.0	8.5	5.3	6.5
Saint Vincent, Minn	8.9	11.9	10.3	11.3	9.7	7.2	6.6	7.9	9.5	9.9	10.4	5.8	9.1
Salt Lake City, Utah	4.7	4.2	5.0	6.0	6.1	5.8	5.8	4.3	5.2	5.6	3.8	3.0	5.0
San Antonio, Tex	9.3	8.6	9.8	9.7	7.9	6.3	6.6	6.0	8.5	7.5	8.2	7.4	8.0
San Diego, Cal	4.9	4.6	5.4	6.9	6.5	6.3	5.7	5.4	5.4	5.4	4.9	3.7	5.4
Sandusky, Ohio	14.0	15.5	13.5	13.0	10.5	9.8	9.1	10.0	10.7	12.5	15.4	12.4	12.2
Sandy Hook, N. J[5]	19.7	21.8	18.3	15.0	15.6	13.0	11.2	12.7	13.7	17.4	19.5	.....	.....
Sanford, Fla	6.9	5.9	6.7	8.1	5.3	5.4	4.9	5.9	7.6	9.1	6.6	5.9	6.5
San Francisco, Cal	7.0	6.5	8.0	10.1	10.2	13.0	12.2	11.8	8.8	8.0	6.9	5.3	9.0
Santa Fé, N. Mex	7.5	7.9	8.8	9.8	7.3	6.4	6.2	5.7	5.3	6.5	7.9	6.7	7.2
Savannah, Ga	9.0	8.2	8.6	9.7	8.0	7.0	6.0	6.2	6.4	6.4	6.1	6.4	7.3
Shaw, Fort, Mont[6]	9.0	10.8	6.8	7.5	6.4	4.4	4.4	3.4	3.0	3.3	.....	.....	.....
Shreveport, La	([7])	6.9	7.9	6.5	6.1	5.9	3.8	4.0	4.6	4.3	6.0	6.5	.....

[1] Station closed November 10, 1886.
[2] Station closed August 20, 1886.
[3] Station closed December 31, 1886.
[4] Station closed June 30, 1886.
[5] Station closed November 30, 1886.
[6] Station closed October 27, 1886.
[7] No record.

Average hourly velocity of the wind (in miles) at stations of the Signal Service, U. S. Army, etc.—Continued.

Districts and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Sill, Fort, Ind. T	11.3	11.0	13.9	13.8	10.2	11.8	8.7	8.9	10.4	9.3	10.6	12.0	11.0
Sitka, Alaska	10.6	5.7	4.3	9.9	8.2	8.3	7.0	6.6	8.3	10.0	14.4	13.1	8.9
Smithville, N. C. (1)	9.0	10.8	11.3	11.7	11.9	11.4	10 9	10.2	8.5	8.2	.....	.....	.....
Spokane Falls, Wash	4.2	4.7	6.7	5.4	5.8	5.3	3.9	4.2	4.4	4.0	3.0	4.1	4.7
Springfield, Ill	10.6	12.0	11.0	10.3	7.3	5.8	5.0	6.2	7.5	6.9	10.2	8.0	8.4
Stanton, Fort, N. Mex	10.4	9.0	10.5	11.1	(3)	5.7	5.0	4.4	4.2	5.7	9.2	8.9	.....
Stockton, Fort, Tex (2)	(3)	9.2	9.9	13.2	9.3	5.7	.....	.....	.....	.....	.....	.....	.....
Sully, Fort, Dak	8.7	10.4	9.6	11.2	8.1	7.8	7.8	7.8	7.3	9.8	11.5	7.7	9.0
Tatoosh Island, Wash	19.5	15.2	13.7	11.7	9.8	7.9	8.7	8.8	11.1	10.3	14.5	16.7	12.3
Thomas, Fort, Ariz	3.1	4.0	5.0	5.3	4.4	4.2	5.3	5.6	3.6	3.3	3.5	2.3	4.1
Toledo, Ohio	7.1	10.1	9.9	9.9	7.2	6.7	6.5	6.5	6.5	7.0	10.4	8.3	8.0
Totten, Fort, Dak	12 5	16.4	14.4	16.8	13.8	10.4	10.6	10.7	15.2	13.0	13.8	10.2	13.2
Unalashka, Alaska (4)	12.8	15.0	14.7	13.6	10.7	.....	.....	.....	.....	.....	.....	.....	.....
Valentine, Nebr	12.3	13.6	13.5	15.1	10.9	10.0	11.6	11.2	11.9	12.6	14.6	11.2	12.4
Vicksburg, Miss	5.1	6.0	5.8	6.2	7.0	5.8	4.3	4.4	5.5	5.0	6.7	7.1	5.7
Walla Walla, Wash	5.9	6.5	8.4	7.2	7.0	6.7	5.9	5.4	6.3	5.1	5.1	6.2	6.3
Washington City	6.3	7.9	8.5	5.9	5.5	5.1	4.5	4.5	4.7	4.8	6.2	5.6	5.8
Wilmington, N. C	6.5	6.9	7.9	7.7	7.8	6.6	5.8	6.1	5.5	5.2	6.4	5.7	6.5
Winnemucca, Nev	9.7	7.8	9.1	10.2	8.4	8.0	6.9	6.4	6.6	6.4	7.4	8.7	8.0
Yankton, Dak	10.3	10.4	8.9	11.0	6.3	6.7	7.1	5.8	8.6	8.6	9.9	7.9	8.5
Yuma, Ariz	6.2	5.6	7.1	8.0	6.6	6.1	6.5	6.4	4.1	5.0	7.4	5.4	6.2

1 Station closed October 31, 1886.
2 Station closed June 20, 1886.
3 No record.
4 Station closed May 22, 1886.

APPENDIX No. 37.

Maximum velocity of the wind (in miles per hour) at stations of the Signal Service, U. S. Army, for each month of the year 1886.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Abilene, Tex	44	29	36	44	32	36	23	48	26	36	35	38
Albany, N. Y	36	34	34	39	28	24	25	31	26	27	32	24
Alexander, Fort, Alaska[1]	65	65	60	47	62	48	......	......	......	......	......	......
Alpena, Mich	27	35	26	30	28	32	26	40	26	36	36	31
Apache, Fort, Ariz	30	27	33	36	37	29	35	34	32	28	43	20
Assinaboine, Fort, Mont	45	55	54	37	45	45	59	42	41	48	49	52
Atlanta, Ga	36	32	33	33	32	32	19	26	22	24	30	36
Atlantic City, N. J	53	37	31	32	39	35	25	37	22	25	42	36
Augusta, Ga	25	19	24	24	26	24	30	16	17	17	20	23
Baltimore, Md	27	36	25	28	20	18	23	17	21	20	28	26
Behring's Island, Behring Sea[2]	37	26	41	42	......	......	......	......	......	......	......	......
Benton, Fort, Mont.[3]	26	58	31	45	25	28	36	49	37	......	......	......
Bidwell, Fort, Cal	28	28	23	24	20	20	26	22	18	25	28	30
Bismarck, Dak	27	39	37	42	31	28	28	48	40	33	53	45
Block Island, R. I	64	54	44	40	38	31	30	40	34	42	52	51
Boisé City, Idaho	26	25	30	24	20	21	22	15	21	18	21	18
Boston, Mass	64	49	41	51	36	27	27	34	32	40	44	37
Bridger, Fort, Wyo	40	39	40	46	38	36	32	32	39	33	40	40
Brownsville, Tex	36	29	31	26	27	20	24	19	68	20	[4]28	28
Buffalo, N. Y	48	57	36	46	33	32	22	28	44	63	58	44
Buford, Fort, Dak	40	46	52	36	46	36	48	40	48	30	52	50
Cairo, Ill	33	28	44	29	37	28	25	38	30	32	32	32
Canby, Fort, Wash	68	64	46	44	36	32	42	42	42	50	48	58
Cape Henry, Va.[5]	60	52	48	40	60	34	36	44	38	44	60	47
Cape Mendocino, Cal	144	75	70	80	80	52	56	42	45	44	64	88
Cedar Keys, Fla	32	25	33	34	34	68	35	32	27	32	34	38
Charleston, S. C	29	24	26	32	24	44	28	21	24	26	28	24
Charlotte, N. C	27	26	28	22	25	24	22	26	20	16	36	18
Chattanooga, Tenn	26	34	30	32	28	22	22	20	17	22	36	28
Cheyenne, Wyo	52	46	56	40	30	20	32	32	38	40	(6)	(6)
Chicago, Ill	28	29	20	30	22	20	23	24	22	37	32	27
Chincoteague, Va	40	61	51	30	50	32	36	37	31	34	46	52
Cincinnati, Ohio	31	34	30	29	30	28	33	44	32	40	36	39
Cleveland, Ohio	34	28	30	44	24	22	20	32	32	44	40	31
Columbus, Ohio	34	32	32	28	28	22	39	34	29	45	40	40
Concordia, Kans	38	37	34	44	32	30	24	24	29	36	36	36
Custer, Fort, Mont	(7)	(6)	35	36	36	44	39	32	31	37	[8]41	38
Davenport, Iowa	26	32	27	39	36	24	27	32	34	38	34	24
Davis, Fort, Tex	32	30	32	38	28	56	28	31	22	20	38	38
Deadwood, Dak	33	31	26	26	16	17	23	17	18	21	14	23
Denver, Colo	42	42	43	32	39	40	32	34	36	32	38	36
Des Moines, Iowa	20	22	22	24	20	24	19	24	24	22	26	23
Detroit, Mich	32	35	27	40	27	26	24	26	30	52	34	28
Dodge City, Kans	44	40	52	56	45	44	38	30	35	33	44	40
Dubuque, Iowa	16	20	22	20	20	16	16	18	20	25	24	18
Duluth, Minn	40	40	36	36	28	28	23	28	30	30	40	38
Eastport, Me	60	40	44	58	29	25	20	25	24	(6)	(6)	(6)
Elliott, Fort, Tex	59	45	48	50	49	46	64	40	(7)	36	50	52
El Paso, Tex	28	24	25	25	21	29	30	28	24	20	23	26
Erie, Pa	43	37	33	33	26	24	24	24	30	36	43	42
Escanaba, Mich	30	34	29	32	24	24	21	20	26	27	28	28
Fort Smith, Ark	25	21	24	(9)	14	49	18	12	17	16	30	24
Frisco, Utah	60	30	38	36	37	56	48	36	32	50	43	43
Galveston, Tex	42	37	36	32	30	50	32	53	34	55	28	32
Grand Haven, Mich	40	36	36	31	34	25	28	28	41	52	52	39
Grant, Fort, Ariz	37	40	34	33	32	(6)	(6)	44	40	36	40	28
Greencastle, Ind[10]	24	28	32	24	30	15	16	31	28	30	......	......

[1] Station closed June 12, 1886.
[2] Station closed May 7, 1886.
[3] Station closed December 8, 1886.
[4] For 28 days.
[5] Station closed December 31, 1886.
[6] No record.
[7] Incomplete.
[8] For 29 days.
[9] Gale.
[10] Station closed November 10, 1886.

Maximum velocity of the wind (in miles per hour) at stations of the Signal Service, U. S. Army, etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Hatteras, N. C	46	40	39	30	48	26	27	36	23	23	40	37
Helena, Mont	42	41	36	40	32	40	44	36	30	28	44	44
Huron, Dak	34	38	44	38	27	30	32	40	34	34	42	31
Indianapolis, Ind	24	28	22	20	20	18	24	32	22	26	29	28
Indianola, Tex [1]	60	48	44	46	40	49	40	......	......	......	......	...
Jacksonville, Fla	37	30	34	36	27	36	28	25	24	20	28	26
Keeler, Cal	36	26	38	40	35	36	40	20	29	40	39	29
Keokuk, Iowa	24	31	28	37	26	27	19	60	32	31	30	28
Key West, Fla	30	31	35	48	26	40	52	40	32	32	29	41
Kitty Hawk, N. C. [2]	48	48	48	42	56	40	42	44	38	37	44	52
Knoxville, Tenn	32	36	38	33	27	24	26	32	20	28	42	22
La Crosse, Wis	24	35	42	25	32	28	24	30	32	27	36	28
Lamar, Mo	33	36	40	32	36	28	19	26	28	32	38	36
Las Animas, Colo	34	41	40	50	44	40	39	36	36	28	42	44
Leavenworth, Kans	24	25	27	32	36	28	19	22	22	28	27	28
Little Rock, Ark	25	30	25	32	23	24	36	24	28	18	24	28
Los Angeles, Cal	37	29	25	28	20	17	22	18	16	24	30	20
Louisville, Ky	36	33	31	26	35	24	24	32	26	38	26	28
Lynchburgh, Va	17	27	23	15	17	16	23	14	12	16	22	20
Mackinaw City, Mich	36	39	36	30	30	28	26	24	28	35	53	36
Macon, Fort N. C. [2]	62	44	51	48	44	47	48	56	31	36	46	34
Maginnis, Fort, Mont	56	78	43	62	44	28	33	21	46	46	52	54
Marquette, Mich	36	38	35	29	32	26	28	25	30	34	39	34
Memphis, Tenn	30	32	32	33	32	28	26	24	36	30	34	33
Milwaukee, Wis	39	39	37	34	33	32	32	29	39	48	44	39
Mobile, Ala	32	28	27	36	28	22	24	28	21	24	32	28
Montgomery, Ala	30	22	25	24	28	32	16	20	20	24	25	25
Montrose, Colo	40	44	36	30	34	30	44	26	32	34	32	20
Moorhead, Minn	38	44	38	46	44	36	36	36	50	44	48	34
Mount Washington, N. H	122	138	115	110	88	94	84	88	100	89	99	100
Nashville, Tenn	30	35	36	38	32	29	75	37	20	28	39	27
New Haven, Conn	44	34	32	39	30	18	19	24	18	26	32	32
New London, Conn	40	43	32	30	31	22	23	27	24	22	48	24
New Orleans, La	31	26	23	29	23	24	24	23	27	38	26	25
New York City	44	64	54	40	34	26	29	24	27	28	40	34
Norfolk, Va	38	28	35	24	27	20	26	23	21	21	34	23
North Platte, Nebr	32	30	36	48	32	36	40	32	32	60	40	34
Olympia, Wash	23	19	20	21	16	16	14	16	18	20	21	17
Omaha, Nebr	38	34	36	34	29	32	24	22	24	30	37	30
Oswego, N. Y	39	40	40	33	33	26	24	30	32	36	41	33
Palestine, Tex	40	32	32	32	26	48	30	39	32	28	28	33
Pensacola, Fla	28	21	28	33	29	25	24	24	24	27	29	37
Philadelphia, Pa	40	48	36	43	35	26	36	36	28	28	40	34
Pike's Peak, Colo	88	76	76	88	74	64	61	40	64	76	86	80
Pittsburgh, Pa	35	28	22	25	25	28	25	28	22	30	32	28
Poplar River, Mont	33	37	42	36	41	29	40	48	48	37	46	42
Port Angeles, Wash	35	29	24	28	20	22	21	20	16	15	25	15
Port Huron, Mich	36	36	34	44	28	26	28	26	40	50	44	38
Portland, Me	40	40	32	36	26	22	24	22	28	31	44	28
Portland, Oregon	22	21	23	31	21	22	17	20	24	21	22	24
Prescott, Ariz	44	38	36	32	37	29	29	24	26	36	40	24
Red Bluff, Cal	50	24	28	40	26	28	24	16	24	18	26	33
Rio Grande City, Tex	19	21	20	21	18	18	21	19	15	14	21	20
Rochester, N. Y	60	54	40	36	32	32	28	34	34	44	48	40
Roseburgh, Oregon	20	15	14	18	17	13	16	13	18	16	14	24
Sacramento, Cal	44	32	37	36	27	42	20	18	26	17	36	25
Saint Louis, Mo	44	41	37	33	44	38	28	46	40	52	43	36
Saint Michael's, Ft, Alaska [3]	66	60	58	48	62	30	......	......	......	......	......	...
Saint Paul, Minn	24	26	36	28	28	37	22	31	32	29	35	21
Saint Vincent, Minn	33	45	39	36	35	28	27	39	39	30	46	39
Salt Lake City, Utah	32	21	25	32	28	28	28	26	22	28	28	28
San Antonio, Tex	31	42	30	28	28	34	28	60	24	28	30	24
San Diego, Cal	29	20	28	37	21	24	19	19	18	19	32	16
Sandusky, Ohio	50	51	40	46	35	35	36	36	46	53	47	52
Sandy Hook, N. J. [4]	66	72	60	60	48	40	66	60	40	48	60	....
Sanford, Fla	26	28	23	33	18	28	27	26	26	32	23	22
San Francisco, Cal	42	25	31	26	31	34	32	34	31	28	30	20
Santa Fé, N. Mex	28	25	29	38	32	31	27	28	21	24	28	26
Savannah, Ga	32	28	32	37	25	28	26	32	23	27	28	26
Shaw, Fort, Mont. [5]	44	52	48	32	41	36	32	27	30	[6] 29	....	....
Shreveport, La.	([7])	24	28	21	24	21	19	19	18	25	24	25
Sill, Fort, Ind. T	40	39	52	44	42	37	32	27	34	36	31	46
Sitka, Alaska	42	68	23	40	39	34	32	32	40	40	55	52
Smithville, N. C. [8]	44	40	42	33	36	36	44	28	24	20	......	...

[1] Station closed August 20, 1886.
[2] Station closed December 31, 1886.
[3] Station closed June 30, 1886.
[4] Station closed November 30, 1886.
[5] Station closed October 27, 1886.
[6] For 27 days.
[7] No record.
[8] Station closed October 31, 1886.

Maximum velocity of the wind (in miles per hour) at stations of the Signal Service, U. S. Army, etc.—Continued.

Stations	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Spokane Falls, Wash	36	34	42	26	25	27	23	25	32	25	23	25
Springfield, Ill	29	36	36	28	26	24	20	33	24	34	34	28
Stanton, Fort, N. Mex	49	40	48	36	(1)	27	44	22	26	35	40	46
Stockton, Fort, Tex. [2]	(1)	38	47	41	36	32	......	......	......	......	......	....
Sully, Fort, Dak	44	44	44	44	37	39	36	46	42	36	48	40
Tatoosh Island, Wash	54	56	47	48	37	25	33	28	46	39	43	51
Thomas, Fort, Ariz	18	25	26	29	24	23	33	32	19	21	24	20
Toledo, Ohio	37	40	29	33	23	26	27	26	26	44	36	32
Totten, Fort, Dak	43	56	40	42	42	40	32	52	48	45	64	50
Unalashka, Alaska [3]	46	40	40	40	36	......	......	......	......	......	......	....
Valentine, Nebr	66	75	44	60	54	38	44	42	42	48	55	56
Vicksburg, Miss	27	30	28	26	20	24	21	24	20	25	24	30
Walla Walla, Wash	30	35	44	26	40	24	22	20	36	26	24	26
Washington City	28	38	30	30	24	19	18	16	21	24	29	26
Wilmington, N. C	25	30	30	25	30	24	30	20	20	16	34	25
Winnemucca, Nev	41	36	40	42	35	31	31	25	27	34	25	29
Yankton, Dak	39	36	38	39	32	30	30	32	32	37	37	36
Yuma, Ariz	30	26	36	44	32	24	32	34	19	30	38	23

[1] No record. [2] Station closed June 20, 1886. [3] Station closed May 22, 1886.

APPENDIX NO. 38.

Average cloudiness—scale of 0 to 10—at stations of the Signal Service, U. S. Army, for each month and the year 1886. (Computed from the tri-daily telegraphic observations.)

[The monthly average is obtained by dividing the sums of the amount of cloudiness recorded daily by the number of observations taken.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Abilene, Tex	3.7	3.2	3.9	3.0	2.1	3.5	3.8	3.1	4.1	2.2	3.8	2.8	3.3
Albany, N. Y	6.8	5.9	6.8	6.1	5.6	5.5	4.5	4.1	4.9	5.2	6.2	6.9	5.7
Alexander, Fort, Alaska[1]	3.1	5.0	7.4	4.8	7.4	....	....	....	....	....	....	....	....
Alpena, Mich	7.6	6.3	6.3	5.2	4.8	4.7	4.1	4.6	5.9	5.6	7.6	7.9	5.9
Apache, Fort, Ariz	4.0	2.4	2.3	1.8	2.2	1.3	4.9	4.8	3.1	2.2	2.5	2.2	2.8
Assinaboine, Fort, Mont	5.5	5.8	4.7	4.0	4.2	5.0	3.4	3.2	4.8	5.2	4.6	5.6	4.7
Atlanta, Ga	5.8	4.1	4.9	4.8	3.2	6.3	3.4	4.5	3.6	2.4	4.7	4.9	4.4
Atlantic City, N. J	5.0	4.7	4.2	4.2	5.4	5.4	4.6	4.6	4.0	3.6	3.7	4.9	4.5
Augusta, Ga	5.7	4.0	5.2	4.5	3.4	6.4	4.8	5.2	4.2	1.9	3.6	5.3	4.5
Baltimore, Md	6.0	4.4	5.1	5.3	5.9	5.7	4.9	4.4	5.0	3.6	4.6	5.4	5.0
Behring's Island, Behring Sea[2]	8.4	8.6	8.5	8.1	....	....	....	....	....	....	....	...	...
Benton, Fort, Mont[4]	6.6	6.3	5.3	3.9	3.4	5.3	2.4	2.3	3.9	(3)	(3)	....	....
Bidwell, Fort, Cal	5.9	3.7	5.0	5.5	4.6	2.6	2.4	1.3	0.9	5.0	3.2	6.7	3.9
Bismarck, Dak	4.5	4.9	5.6	4.5	4.3	4.5	3.4	4.0	3.4	3.5	4.4	3.4	4.3
Brock Island, R. I	6.4	4.7	5.1	4.5	5.4	4.8	4.0	3.5	5.0	4.8	5.1	6.5	5.0
Boisé City, Idaho	5.7	3.7	4.4	5.2	3.2	2.2	2.2	1.2	1.0	4.5	3.3	6.8	3.6
Boston, Mass	5.6	5.1	5.6	4.8	5.3	5.2	3.9	3.4	5.0	4.0	4.5	5.9	4.9
Bridger, Fort, Wyo	4.8	3.2	4.6	6.1	3.7	3.8	3.7	4.0	1.9	4.1	4.1	4.9	4.1
Brownsville, Tex	4.4	5.2	6.3	5.6	3.3	3.9	3.5	3.0	5.3	2.1	4.2	2.3	4.1
Buffalo, N. Y	8.1	7.3	7.1	5.3	4.6	4.3	4.4	4.2	4.3	5.5	7.4	7.8	5.9
Buford, Fort, Dak	5.7	6.3	6.6	4.5	5.4	5.7	4.8	3.7	4.3	4.7	5.0	5.9	5.2
Cairo, Ill	6.3	4.6	6.8	6.2	4.9	6.1	3.9	4.7	4.3	2.5	5.0	6.3	5.1
Canby, Fort, Wash	6.0	5.7	6.9	6.8	6.0	7.4	6.5	6.4	4.3	4.8	5.1	8.9	6.2
Cape Henry, Va[5]	4.4	2.9	3.5	3.8	4.1	5.3	4.3	5.0	3.9	3.1	3.5	5.1	4.1
Cape Mendocino, Cal[5]	5.2	4.3	5.3	6.3	5.5	4.1	3.6	2.4	2.5	5.0	3.5	5.7	4.4
Cedar Keys, Fla	6.0	3.9	6.4	4.3	4.0	6.7	7.9	5.8	5.3	3.5	2.9	5.1	5.2
Charleston, S. C	4.8	3.9	5.6	4.3	3.5	6.7	5.4	5.2	4.1	3.3	3.8	5.4	4.7
Charlotte, N. C	5.2	3.4	5.5	5.4	5.2	6.7	5.4	6.4	5.1	2.2	4.2	5.5	5.0
Chattanooga, Tenn	6.5	4.4	6.1	5.0	3.8	6.6	3.6	4.8	4.5	2.3	5.0	5.8	4.9
Cheyenne, Wyo	4.3	3.5	4.4	6.1	3.8	4.7	3.8	4.3	3.9	3.7	(3)	(3)	...
Chicago, Ill	6.4	5.6	5.7	5.0	4.2	4.0	2.6	4.5	4.6	3.8	5.2	5.7	4.8
Chincoteague, Va	5.1	3.2	4.0	4.5	4.5	5.5	4.8	4.8	3.9	3.0	4.2	4.7	4.4
Cincinnati, Ohio	7.4	5.4	5.6	5.0	4.6	5.2	3.1	4.4	4.2	3.1	6.0	5.5	5.0
Cleveland, Ohio	7.5	6.3	5.8	4.8	4.5	4.2	3.7	4.4	4.2	4.7	6.6	6.2	5.2
Columbus, Ohio	7.7	5.8	6.4	5.2	4.6	4.6	4.5	4.7	4.5	3.7	5.5	5.6	5.2
Concordia, Kans	4.9	4.0	5.1	4.4	3.1	3.9	2.9	3.1	3.4	3.3	3.4	3.9	3.8
Custer, Fort, Mont	4.7	5.9	5.9	5.0	5.4	5.2	4.2	2.6	3.3	4.8	5.0	6.2	4.8
Davenport, Iowa	6.6	5.6	6.0	5.7	4.5	4.0	2.5	4.5	5.4	3.6	5.3	4.2	4.8
Davis, Fort, Tex	1.8	2.3	2.1	1.4	1.7	3.4	3.1	3.5	3.6	1.8	2.2	1.6	2.4
Deadwood, Dak	3.5	4.2	4.9	5.0	3.6	3.3	3.3	2.0	2.6	2.9	4.4	4.1	3.6
Denver, Colo	3.5	3.8	4.5	6.3	3.2	4.0	3.7	4.2	2.7	3.1	3.3	2.8	3.8
Des Moines, Iowa	6.8	5.4	7.1	7.0	5.6	5.1	3.6	4.9	5.4	3.5	5.0	3.8	5.3
Detroit, Mich	7.7	6.8	5.9	5.0	4.6	4.1	4.0	4.6	4.9	4.0	6.5	6.4	5.4
Dodge City, Kans	5.2	3.3	4.3	4.0	3.0	3.8	3.1	3.0	4.1	2.9	2.1	2.8	3.5
Dubuque, Iowa	6.1	5.3	6.0	5.9	4.8	3.0	2.5	4.6	4.6	3.3	4.7	3.9	4.5
Duluth, Minn	6.2	5.3	4.7	4.2	3.7	4.3	3.2	3.1	4.6	3.8	4.6	4.6	4.4
Eastport, Me	6.7	6.7	6.2	3.5	5.1	4.1	3.5	2.8	4.5	4.5	6.0	6.1	5.0
Elliott, Fort, Tex	3.6	3.5	3.7	3.5	2.9	4.0	3.2	2.4	(6)	3.7	2.6	2.3	....
El Paso, Tex	3.1	2.9	2.8	1.6	3.7	2.4	4.5	3.9	4.0	1.5	2.7	1.4	2.9
Erie, Pa	8.1	6.7	6.5	4.4	4.1	3.7	3.9	4.1	4.3	5.0	7.6	7.6	5.5
Escanaba, Mich	7.5	6.6	6.3	5.1	5.8	5.4	4.2	4.3	5.5	4.2	5.8	5.4	5.5
Fort Smith, Ark	6.8	4.5	5.6	5.3	3.4	5.9	4.0	3.5	5.4	3.4	4.7	4.7	4.8
Frisco, Utah	4.7	3.3	4.3	4.9	2.2	1.6	2.5	3.9	0.8	2.3	2.6	3.1	3.0
Galveston, Tex	5.0	4.0	5.3	4.5	3.6	4.7	3.9	3.5	5.2	1.9	4.4	3.8	4.1
Grand Haven, Mich	8.5	7.4	5.8	5.9	4.9	3.0	2.7	4.3	6.0	5.5	7.4	7.7	5.8
Grant, Fort, Ariz	3.7	2.3	1.9	0.9	2.0	(3)	(3)	4.4	2.4	1.6	2.3	2.4	...
Greencastle, Ind[7]	7.5	5.7	5.9	5.4	4.4	4.2	2.7	4.3	4.1	2.8	....	....	....

[1] Station closed June 12, 1886.
[2] Station closed May 7, 1886.
[3] No record.
[4] Station closed December 8, 1886.
[5] Station closed December 31, 1886.
[6] Incomplete.
[7] Station closed November 10, 1886.

Average cloudiness—scale of 0 to 10—at stations of the Signal Service, U. S. Army, for each month and the year 1886, etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Hatteras, N. C	4.9	3.5	4.0	4.1	3.5	5.0	4.4	5.4	3.5	3.2	3.2	4.7	4.1
Helena, Mont	5.6	5.0	5.2	5.7	4.8	4.7	3.6	1.4	3.4	5.2	5.5	6.4	4.7
Huron, Dak	4.9	4.6	6.1	4.8	4.4	3.5	3.7	3.6	4.0	3.1	4.8	4.1	4.3
Indianapolis, Ind	7.4	5.9	6.0	5.9	5.1	5.1	3.5	4.9	4.5	3.1	5.7	5.3	5.2
Indianola, Tex[1]	4.4	3.6	5.6	4.9	3.0	3.7	4.2	....	....	....	....	....	....
Jacksonville, Fla	6.0	4.0	6.4	4.3	3.6	5.8	6.7	5.1	5.0	4.2	2.4	4.5	4.8
Keeler, Cal	2.9	1.3	2.1	1.0	1.4	0.4	0.8	1.7	0.1	2.0	1.8	2.8	1.6
Keokuk, Iowa	5.8	4.5	5.6	4.9	3.6	3.4	1.6	2.9	4.2	2.9	4.3	3.7	3.9
Key West, Fla	6.2	4.3	3.9	4.0	3.8	5.7	6.7	4.9	5.2	5.3	4.6	4.7	5.0
Kitty Hawk, N. C[2]	5.6	3.4	4.2	4.4	4.4	5.6	4.2	5.9	4.6	3.4	4.0	5.0	4.5
Knoxville, Tenn	6.7	5.3	6.1	6.1	4.7	7.0	4.9	5.1	4.6	3.0	5.0	4.9	5.3
La Cross, Wis	6.4	5.1	5.3	5.1	3.6	4.1	3.0	3.9	5.5	3.4	5.1	5.2	4.6
La Mar, Mo	6.1	4.0	6.3	4.8	3.3	4.6	3.3	3.5	4.1	2.8	4.1	3.8	4.2
Las Animas, Colo	4.6	3.5	4.3	5.4	3.1	3.8	3.4	3.3	3.0	2.7	2.4	3.5	3.6
Leavenworth, Kans	6.1	4.2	5.7	6.1	3.6	4.2	2.7	3.0	4.0	3.2	3.9	4.3	4.2
Little Rock, Ark	6.3	3.7	5.5	5.6	4.4	6.2	4.8	4.1	4.6	2.6	4.2	5.1	4.8
Los Angeles, Cal	4.7	2.4	4.1	4.5	3.2	3.9	2.8	2.1	2.5	3.2	1.6	2.6	3.1
Louisville, Ky	6.8	4.7	5.8	5.5	4.9	6.2	3.4	4.4	4.6	2.9	5.3	5.7	5.0
Lynchburgh, Va	6.2	4.4	5.7	5.5	5.6	6.8	5.0	5.8	5.1	2.6	4.7	6.1	5.3
Mackinaw City, Mich	6.9	5.7	6.0	4.7	4.5	4.1	3.0	3.6	5.6	4.7	6.9	6.8	5.2
Macon, Fort, N. C[2]	5.1	3.5	4.4	4.7	3.7	5.6	5.5	6.0	3.9	2.4	2.9	5.4	4.4
Maginnis, Fort Mont	6.3	6.8	6.3	4.7	5.0	5.9	4.8	3.6	3.9	4.2	5.3	5.8	5.2
Marquette, Mich	8.4	7.1	5.8	5.0	5.2	5.2	4.0	4.8	6.1	4.8	6.9	7.4	5.9
Memphis, Tenn	6.6	3.5	5.6	4.5	3.2	5.6	2.4	3.5	3.9	1.8	4.7	5.2	4.2
Milwaukee, Wis	7.4	5.5	5.9	5.5	3.7	3.4	3.5	4.8	5.6	4.3	5.8	5.7	5.1
Mobile, Ala	5.7	4.1	5.3	4.0	3.0	4.9	4.3	3.8	3.6	2.3	4.2	5.3	4.2
Montgomery, Ala	6.4	4.7	5.9	4.5	3.2	6.7	4.8	5.3	4.3	2.4	4.8	4.8	4.8
Montrose, Colo	5.6	3.5	5.0	5.8	2.8	1.9	3.4	4.3	2.3	3.6	3.6	3.9	3.8
Moorhead, Minn	4.8	5.8	6.1	5.4	4.4	4.2	3.5	3.1	4.8	5.2	5.6	6.0	4.9
Mount Washington, N. H	4.5	3.7	4.9	4.3	3.7	4.2	3.8	3.9	3.5	3.7	3.8	4.0	4.0
Nashville, Tenn	7.4	4.6	6.6	5.5	4.9	6.0	2.9	4.9	3.8	2.7	5.1	6.6	5.1
New Haven, Conn	6.1	4.5	5.6	5.7	5.7	5.2	5.1	4.3	5.6	4.8	5.0	5.6	5.3
New London, Conn	5.7	5.0	6.1	4.9	6.0	6.0	6.0	4.8	5.9	5.1	5.1	5.5	5.5
New Orleans, La	5.3	4.5	5.8	4.5	3.2	5.1	4.7	4.0	4.6	2.2	4.4	4.5	4.4
New York City	5.5	3.8	5.0	4.6	5.6	4.8	3.9	3.5	5.3	4.3	4.7	5.1	4.6
Norfolk, Va	5.0	3.0	3.9	4.9	4.9	5.9	4.8	5.9	4.5	3.3	4.4	5.7	4.7
North Platte, Nebr	3.8	3.4	5.1	5.6	4.1	4.2	3.5	3.0	2.6	2.9	2.9	3.7	3.7
Olympia, Wash	7.3	7.4	5.0	6.0	5.0	5.1	3.8	3.2	3.5	6.0	5.9	8.0	5.5
Omaha, Nebr	5.4	3.2	5.6	5.5	3.8	3.7	3.1	4.2	5.0	4.1	4.6	4.9	4.4
Oswego, N. Y	8.9	8.0	7.1	5.2	4.8	4.8	4.1	4.6	4.7	5.9	8.3	8.3	6.3
Palestine, Tex	4.6	4.1	5.3	4.8	3.0	4.5	4.2	3.1	5.0	3.0	4.3	4.4	4.2
Pensacola, Fla	5.5	4.2	5.4	4.5	2.9	4.6	4.7	4.4	3.9	2.2	3.9	4.7	4.2
Philadelphia, Pa	5.8	4.0	5.1	5.8	5.8	5.3	4.7	4.6	5.3	3.9	4.4	5.5	5.0
Pike's Peak, Colo	3.7	3.2	3.8	4.4	2.6	3.5	3.4	4.7	2.3	2.9	2.0	2.6	3.2
Pittsburg, Pa	7.7	6.4	6.0	5.3	5.4	5.0	4.5	5.3	4.2	3.9	6.0	6.1	5.5
Poplar River, Mont	5.1	6.4	5.4	3.4	3.9	4.7	2.7	2.2	3.3	4.1	4.4	4.8	4.2
Port Angeles, Wash	7.3	7.4	5.4	6.6	5.6	5.3	3.7	3.4	3.2	5.7	5.9	7.4	5.6
Port Huron, Mich	7.9	6.7	5.9	4.8	4.8	4.1	3.4	4.3	5.1	4.8	6.6	5.8	5.4
Portland, Me	6.4	5.2	5.9	4.7	5.3	5.3	4.3	3.5	5.0	4.7	5.0	5.9	5.2
Portland, Oregon	7.1	6.6	4.7	6.1	5.8	5.2	4.0	2.4	3.1	5.5	4.9	7.5	5.2
Prescott, Ariz	4.2	2.0	2.5	1.8	2.4	0.8	3.4	4.4	1.2	1.8	1.5	2.1	2.3
Red Bluff, Cal	4.4	2.6	5.2	5.3	4.2	1.2	1.4	0.7	0.5	3.5	2.6	6.1	3.1
Rio Grande City, Tex	4.0	4.2	4.9	5.2	2.6	4.9	3.0	2.7	6.3	2.1	4.0	1.9	3.8
Rochester, N. Y	8.9	8.0	7.7	6.0	5.2	5.2	5.0	4.8	5.3	5.9	7.7	8.2	6.5
Roseburg, Oregon	7.1	5.9	5.6	5.5	5.1	3.9	4.2	2.1	2.3	5.6	4.9	6.8	4.9
Sacramento, Cal	3.6	2.3	3.7	3.9	2.1	0.0	0.2	0.2	0.1	1.7	1.3	4.4	2.0
Saint Louis, Mo	5.8	3.9	6.4	5.4	4.2	4.4	2.6	3.9	4.3	2.8	5.2	5.4	4.5
Saint Michael's, Fort, Alaska[3]	8.9	3.9	5.7	5.3	8.5	7.9	....	....	....	....	....	....	....
Saint Paul, Minn	5.9	5.6	5.6	6.0	4.3	4.0	3.7	3.4	6.0	4.2	4.9	4.2	4.8
Saint Vincent, Minn	3.8	4.7	5.1	5.5	4.5	4.6	3.8	2.9	4.9	4.7	4.3	4.0	4.4
Salt Lake City, Utah	5.8	4.3	4.9	6.2	3.9	2.7	2.6	3.7	1.8	3.5	4.7	5.2	4.1
San Antonio, Tex	4.4	4.9	6.6	6.2	4.1	4.9	4.9	4.3	5.5	3.6	5.5	3.0	4.8
San Diego, Cal	4.5	2.7	5.5	4.3	4.1	6.4	5.9	2.9	4.9	5.7	2.0	3.6	3.9
Sandusky, Ohio	7.6	6.4	5.6	4.9	4.3	4.3	3.7	5.1	4.3	4.5	6.3	6.1	5.3
Sandy Hook, N. J.[4]	4.9	3.8	4.6	4.6	5.5	4.6	3.9	3.7	4.4	4.5	4.9	....	....
Sanford, Fla	5.7	4.3	6.1	3.8	3.4	4.8	6.4	4.4	4.0	5.3	2.7	5.1	4.7
San Francisco, Cal	5.6	3.2	3.8	5.3	4.1	2.5	3.5	4.3	3.3	3.3	2.3	5.6	3.9
Santa Fé, N. Mex	2.9	2.1	2.1	3.2	2.3	2.1	2.7	3.5	2.5	1.7	1.7	1.3	2.4
Savannah, Ga	5.0	4.1	5.6	3.8	3.0	5.5	5.3	5.1	4.3	3.0	3.6	5.0	4.4
Shaw, Fort, Mont.[5]	4.2	3.9	4.0	4.3	3.3	5.1	3.0	2.0	3.5	5.2	....	....	....
Shreveport, La	5.4	4.5	5.8	4.8	2.9	5.2	3.2	2.1	3.7	2.5	4.2	4.4	4.0
Sill, Fort, Ind. T	4.0	2.8	3.5	3.8	2.0	3.4	2.8	3.1	3.9	2.8	3.5	2.5	3.2
Sitka, Alaska	4.7	8.0	7.9	6.5	6.2	7.2	6.9	7.0	8.3	7.6	8.3	5.1	7.1
Smithville, N. C.[6]	5.5	3.5	4.4	3.8	3.2	5.3	4.9	6.0	3.6	2.5	....	....	....

[1] Station closed August 20, 1886.
[2] Station closed December 31, 1886.
[3] Station closed June 30, 1886.
[4] Station closed November 30, 1886.
[5] Station closed October 27, 1886.
[6] Station closed October 31, 1886.

Average cloudiness—scale of 0 *to* 10—*at stations of the Signal Service, U. S. Army, for each month and the year* 1886, *etc.*—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Spokane Falls, Wash	6.3	3.6	4.3	4.7	3.6	4.0	2.5	0.9	1.8	3.9	3.7	7.5	3.0
Springfield, Ill	6.2	4.4	5.7	5.3	4.4	3.8	2.8	3.1	4.7	2.7	5.1	5.0	4.4
Stanton, Fort, N. Mex	3.1	2.1	2.2	2.0	([1])	2.7	3.1	3.6	3.5	1.8	2.2	2.0	....
Stockton, Fort, Tex.[2]	([1])	3.2	3.2	2.3	1.4	[4]3.4	.....	.....	.....	.....	.....	.....	...
Sully, Fort, Dak	4.9	5.2	6.1	4.7	5.0	3.5	3.7	2.6	3.5	2.4	4.2	5.6	4.3
Tatoosh Island, Wash	7.5	8.1	5.8	6.6	6.5	6.1	6.2	4.5	4.0	5.3	6.0	8.5	6.2
Thomas, Fort, Ariz	4.0	2.1	1.6	1.4	1.8	1.3	4.1	3.4	2.1	1.6	1.7	1.0	2.2
Toledo, Ohio	7.4	6.7	5.6	5.1	4.6	4.6	3.7	4.8	4.7	4.3	6.8	6.1	5.4
Totten, Fort, Dak	4.1	5.6	5.2	5.1	4.1	4.6	3.0	2.7	4.1	5.2	4.1	4.7	4.4
Unalashka, Alaska[5]	8.2	8.9	7.5	7.7	[6]7.8	.....	.....	.....	.....	.....	.....	.....	....
Valentine, Nebr	5.3	5.7	6.0	6.1	5.5	5.5	4.0	4.0	3.5	3.4	4.5	5.8	5.0
Vicksburg, Miss	6.4	4.9	5.8	5.0	3.5	5.5	3.9	3.5	4.4	2.3	4.9	5.2	4.6
Walla Walla, Wash	6.7	5.1	5.6	5.3	3.8	4.7	2.9	0.6	1.8	4.4	4.6	6.7	4.4
Washington City	6.0	4.4	4.5	5.7	5.9	5.6	5.0	4.5	5.0	3.4	4.8	5.6	5.0
Wilmington, N. C	6.4	3.6	4.2	4.1	4.1	6.1	5.1	5.7	3.9	2.6	3.2	4.9	4.5
Winnemucca, Nev	4.6	2.5	4.2	4.0	2.7	1.6	1.9	1.3	0.7	4.3	2.4	5.1	2.9
Yankton, Dak	5.3	3.9	5.7	5.0	4.2	3.8	3.7	4.3	4.0	3.5	4.4	5.0	4.4
Yuma, Ariz	3.9	2.4	2.0	0.6	2.9	0.1	1.6	3.5	0.1	0.7	1.6	1.0	1.7

[1] Incomplete.
[2] Station closed June 20 1886.
[4] For 20 days.
[5] Station closed May 22, 1886.
[6] For 22 days.

APPENDIX No. 39.

Number of clear, fair, cloudy, and rainy days at stations of the Signal Service, U. S. Army,

[Cloudiness is recorded on a scale of 0 to 10, each observation. Clear days comprise from 0 to 3 tenths.

Original stations.	January.				February.				March.				April.				May.			
	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.
Abilene, Tex	15	11	5	6	17	6	5	2	13	14	4	8	17	10	3	5	22	8	1	2
Albany, N. Y	5	10	16	13	6	14	8	10	3	13	15	16	4	14	12	3	5	17	9	13
Alexander, Fort, Alaska[1]	18	7	6	5	11	6	11	10	5	5	21	18	11	9	10	6	3	8	20	11
Alpena, Mich	1	13	17	23	6	10	12	15	6	10	15	15	9	13	8	15	10	14	7	12
Apache, Fort, Ariz	16	5	10	12	18	9	1	6	19	11	1	5	23	5	2	5	20	10	1	0
Assinaboine, Fort, Mont	7	15	9	9	4	17	7	6	9	16	6	5	12	14	4	6	9	20	2	4
Atlanta, Ga	9	9	13	13	13	9	6	7	7	19	5	11	11	13	6	13	16	13	2	9
Atlantic City, N. J	8	16	7	14	10	11	7	7	11	16	4	10	12	13	5	6	9	11	11	20
Augusta, Ga	9	9	13	10	12	10	6	6	10	14	7	8	10	12	8	6	15	10	6	10
Baltimore, Md	6	14	11	16	8	16	4	8	8	14	9	12	9	13	8	7	8	10	13	17
Behring's Island, Behring Sea[2]	0	8	23	13	0	5	23	12	0	7	24	11	0	7	23	9	...	...	...	...
Benton, Fort, Mont[3]	5	12	14	9	3	16	9	8	9	13	9	6	12	11	7	8	13	17	1	4
Bidwell, Fort, Cal	7	11	13	20	13	12	3	10	10	12	9	10	12	6	12	14	12	10	9	10
Bismark, Dak	[5]9	[5]16	[5]5	[5]11	7	16	5	9	9	11	11	10	12	10	8	6	11	18	2	7
Block Island, R. I	6	13	12	17	8	16	4	9	8	16	7	12	10	12	8	10	6	19	6	12
Boisé City, Idaho	8	13	10	18	15	8	5	8	11	16	4	10	8	13	9	13	15	15	1	4
Boston, Mass	9	11	11	18	10	10	8	10	7	15	9	17	10	14	6	9	5	19	7	13
Bridger, Fort, Wyo	11	12	8	11	11	16	1	2	9	17	5	10	3	18	9	9	14	13	4	2
Brownsville, Tex	13	10	8	6	8	9	11	8	6	11	14	11	6	15	9	4	16	12	3	5
Buffalo, N. Y	1	8	22	24	3	9	16	19	5	9	17	18	8	13	9	13	9	15	7	12
Buford, Fort, Dak	3	21	7	10	2	16	10	12	4	16	11	11	12	11	7	6	5	17	9	7
Cairo, Ill	7	11	13	16	12	8	8	10	6	11	14	11	5	13	12	12	8	16	7	13
Canby, Fort, Wash	6	14	11	21	9	7	12	12	5	10	16	20	3	14	13	21	6	13	12	16
Cape Henry, Va.[7]	6	20	5	9	17	8	3	7	16	10	5	9	14	10	6	8	12	13	6	12
Cape Mendocino, Cal.[7]	9	12	10	18	10	11	7	8	9	13	9	10	6	15	9	11	[6]6	[6]16	[6]6	[6]3
Cedar Keys, Fla	6	14	11	10	13	9	6	8	6	12	13	16	13	10	7	7	13	14	4	4
Charleston, S. C	9	19	3	12	12	11	5	7	6	16	9	10	13	12	5	7	15	11	5	5
Charlotte, N. C	12	9	10	13	14	9	5	6	9	13	9	11	6	16	8	9	6	18	7	9
Chattanooga, Tenn	7	7	17	16	13	7	8	10	6	14	11	10	11	8	11	12	13	15	3	10
Cheyenne, Wyo	8	20	3	10	16	8	4	7	11	15	5	8	4	14	11	12	11	18	2	3
Chicago, Ill	4	15	12	10	[6]5	[6]15	[6]7	[6]9	7	11	13	9	8	13	9	10	12	14	5	10
Chincoteague, Va	7	18	6	15	13	13	2	7	11	15	5	11	8	17	5	12	11	12	8	15
Cincinnati, Ohio	3	10	18	21	7	12	9	9	7	14	10	13	11	11	8	12	11	16	4	11
Cleveland, Ohio	3	12	16	17	2	17	9	12	6	16	9	14	11	11	8	10	11	14	6	10
Columbus, Ohio	3	10	18	18	7	10	11	5	2	19	10	16	11	10	9	14	12	13	6	12
Concordia, Kans	10	12	9	7	14	7	7	5	10	13	8	9	11	12	7	11	16	13	2	10
Custer, Fort, Mont	[6]9	[6]10	[6]9	[6]12	6	13	9	12	5	17	9	13	8	17	5	7	4	21	6	7
Davenport, Iowa	5	13	13	17	9	10	9	7	9	10	12	12	4	18	8	8	11	16	4	10
Davis, Fort, Tex	25	5	1	4	20	4	4	2	21	9	1	3	23	7	0	3	22	9	0	3
Deadwood, Dak	14	14	3	14	13	11	4	14	9	14	8	16	8	15	7	16	12	16	3	8
Denver, Colo	14	15	2	8	11	12	5	4	11	16	4	11	5	12	13	16	16	15	0	4
Des Moines, Iowa	5	11	15	19	5	15	8	6	4	12	15	12	4	8	18	14	7	14	10	10
Detriot, Mich	2	12	17	20	2	12	14	13	8	11	12	15	10	13	7	10	8	18	5	13
Dodge City, Kans	9	13	9	9	17	7	4	7	12	13	6	10	14	10	6	6	16	11	4	5
Dubuque, Iowa	6	15	10	21	7	13	8	11	7	13	11	14	6	13	11	11	8	17	6	11
Duluth, Minn	3	18	10	21	5	16	7	15	12	11	8	9	11	14	5	11	[5]13	[5]14	[5]3	[5]13
Eastport, Me	6	10	15	20	3	11	14	16	4	16	11	14	16	9	5	6	6	21	4	14
Elliott, Fort, Tex	17	9	5	6	13	11	4	5	14	13	4	8	13	13	4	7	18	10	3	3
El Paso, Tex	18	9	4	2	15	11	12	1	18	9	4	1	22	7	1	0	14	12	5	1
Erie, Tex	4	5	22	23	3	13	12	18	6	9	16	15	14	8	8	10	12	15	4	9
Escanaba, Mich	0	15	16	22	5	9	14	17	8	8	15	16	9	11	10	12	4	19	8	17
Fort Smith, Ark	5	10	16	9	11	11	6	5	7	12	12	14	8	14	8	12	14	14	3	4
Frisco, Utah	14	7	10	4	15	10	3	4	15	6	10	7	10	12	8	3	22	8	1	0
Galveston, Tex	9	14	8	10	13	11	4	8	7	15	9	9	9	16	5	8	14	12	5	2
Grand Haven, Mich	1	8	22	23	3	8	17	18	9	8	14	16	8	10	12	12	9	14	8	10
Grant, Fort, Ariz	17	5	9	12	19	7	2	6	23	8	0	5	28	2	0	1	22	7	2	1

[1] Station closed June 12, 1886.
[2] Station closed May 7, 1886.
[3] Station closed December 8, 1886.
[4] No record.
[5] For 30 days.
[6] For 28 days.

APPENDIX No. 39.

for each month of the year 1886 (*computed from the tri-daily telegraphic observations*).

fair, 9 to 22; cloudy, 23 to 30, inclusive; and rainy, those on which .01 inch or more precipitation fell.]

June.				July.				August.				September.				October.				November.				December.			
Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.
15	13	2	5	14	14	3	6	18	10	3	8	13	11	6	7	20	9	2	3	13	12	5	5	20	8	3	0
8	12	10	9	13	13	5	10	13	13	5	8	9	14	7	11	9	14	8	10	4	15	11	14	1	17	13	16
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	20	3	13	14	11	6	7	11	11	9	13	7	13	10	17	9	10	12	14	2	9	19	17	1	11	19	16
24	5	1	3	7	19	5	10	4	23	4	10	14	15	1	8	20	10	1	5	21	6	3	3	23	7	1	1
6	19	5	8	14	16	1	2	15	15	1	4	10	11	9	5	11	9	11	4	9	16	5	4	4	16	9	4
6	12	12	21	4	17	0	8	10	15	6	11	14	14	2	4	19	10	2	2	9	14	7	10	10	12	9	11
5	19	6	10	9	15	7	9	12	11	8	11	12	14	4	9	17	7	7	7	15	9	6	9	11	10	10	14
5	11	14	17	6	22	3	12	9	14	8	9	10	17	3	3	24	5	2	2	13	12	5	7	10	12	9	9
6	16	8	13	13	9	9	12	12	13	6	8	6	19	5	8	16	10	5	7	10	12	8	10	9	11	11	16
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	13	9	14	18	12	1	7	20	8	3	3	13	10	7	5	(4)	(4)	(4)	(4)	(4)	(4)	(4)	...	...	...	...	...
19	7	4	6	19	10	2	6	26	5	0	1	27	3	0	0	11	13	7	9	19	5	6	5	4	10	17	17
7	20	3	11	14	16	1	6	11	17	3	11	11	17	2	5	16	11	4	6	10	14	6	7	9	18	4	12
8	16	6	9	13	14	4	9	15	13	3	10	8	16	6	8	11	11	9	7	7	15	8	9	5	12	14	13
20	9	1	4	21	9	1	2	26	5	0	0	26	3	1	0	10	13	8	9	17	10	3	3	5	14	12	19
9	12	9	12	12	14	5	8	13	15	3	12	10	11	9	10	16	9	6	9	10	13	7	12	6	12	13	12
12	15	3	10	11	17	3	3	13	10	8	10	22	8	0	2	10	18	3	10	14	9	7	8	5	23	3	5
12	14	4	10	13	16	2	7	20	9	2	4	7	17	6	20	22	8	1	2	[6]14	[6]9	[6]5	[6]7	20	11	0	2
12	10	8	10	13	12	6	8	12	14	5	10	12	12	6	15	9	11	11	14	5	6	19	18	1	13	17	19
4	17	9	7	5	24	2	3	11	17	3	4	9	18	3	4	9	14	6	8	7	19	4	7	6	18	7	12
6	9	15	17	13	12	6	5	6	23	2	10	11	12	7	9	18	10	3	4	10	11	9	13	5	12	14	11
2	10	18	9	6	8	17	12	6	10	15	8	14	8	8	10	11	11	9	15	9	12	9	13	0	7	24	28
8	11	11	17	13	11	7	12	9	14	8	15	14	9	7	5	16	14	1	2	15	9	6	9	7	16	8	15
9	17	4	0	12	17	2	1	16	14	1	0	17	11	2	0	9	16	6	11	16	10	4	6	2	20	9	16
3	14	13	12	0	12	19	21	5	15	11	12	5	17	8	9	17	10	4	4	16	12	2	2	8	12	11	15
3	12	15	15	6	19	6	14	11	10	10	13	[6]8	[6]16	[6]4	[6]10	15	12	4	1	13	14	3	5	10	9	12	11
5	11	14	18	8	15	8	14	2	17	12	11	9	13	8	4	22	7	2	1	11	12	7	11	7	15	9	14
4	11	15	18	14	14	3	11	10	13	8	10	11	11	8	8	18	10	3	3	12	10	8	12	5	15	11	16
10	15	5	10	12	17	2	8	12	13	6	14	12	15	3	6	12	13	5	5	...	...	...	...	...	...	...	...
10	18	2	8	18	11	2	6	8	19	4	11	11	11	8	13	[5]18	[5]4	[5]8	[5]7	10	10	10	10	8	12	11	12
7	14	9	15	9	16	6	15	8	17	6	10	10	15	5	7	17	12	2	5	14	8	8	10	9	16	6	16
7	17	6	14	16	12	3	7	12	14	5	13	12	13	5	8	18	9	4	5	5	15	10	11	9	11	11	13
13	11	6	8	16	12	3	9	13	11	7	10	12	14	4	9	11	11	9	7	5	12	13	13	7	10	14	17
11	12	7	13	10	14	7	10	10	16	5	9	10	18	2	10	16	9	6	5	7	13	10	15	10	10	11	16
11	19	0	10	18	9	4	7	16	13	2	7	17	9	4	9	14	14	3	3	14	11	5	5	15	11	5	4
5	20	5	9	8	19	4	5	17	14	0	4	[9]15	[9]9	[9]5	[9]6	10	14	7	9	[9]9	[9]12	[9]8	[9]8	4	16	11	9
13	15	2	8	17	13	1	1	13	8	10	9	7	14	9	14	15	12	4	4	9	13	8	8	12	15	4	8
15	12	3	9	17	14	0	7	15	13	3	7	13	16	1	9	23	6	2	2	20	6	4	3	23	7	1	0
18	10	2	13	17	9	5	9	21	10	0	5	19	9	2	5	19	8	4	7	12	12	6	13	9	20	2	13
9	18	3	11	16	11	4	5	11	18	2	10	18	11	1	4	16	13	2	4	15	11	4	6	16	15	0	6
6	17	7	5	16	10	5	2	11	9	11	9	5	16	9	17	13	14	4	7	9	13	8	9	14	12	5	7
11	15	4	11	13	13	5	6	10	15	6	9	10	13	7	13	15	8	8	7	5	13	12	14	5	14	12	15
12	14	4	10	17	8	6	8	15	15	1	3	14	9	7	4	17	10	4	5	20	7	3	3	18	12	1	2
[8]12	[10]11	[10]0	[10]7	19	12	0	2	10	14	7	9	8	15	7	13	18	9	4	4	9	16	5	7	15	11	5	8
10	15	5	20	15	13	3	10	16	13	2	10	7	18	5	15	13	13	5	11	12	10	8	12	10	13	8	10
9	18	3	8	10	19	2	9	16	13	2	9	10	11	9	14	10	15	6	10	7	13	10	15	7	12	12	17
13	13	4	9	18	9	4	6	22	6	3	5	(11)	(11)	(11)	(11)	[9]13	[9]12	[9]4	[9]6	18	11	1	2	18	13	0	1
20	9	1	6	10	19	2	11	11	19	1	11	[12]6	[12]13	[12]1	[12]0	22	8	1	3	17	10	3	4	26	5	0	1
14	11	5	12	14	12	5	9	13	12	6	9	10	17	3	8	10	11	10	14	2	11	17	19	5	5	21	23
8	12	10	14	10	18	3	8	13	11	7	9	5	16	9	15	12	11	8	8	7	13	10	14	8	16	7	10
6	14	10	13	14	11	6	9	16	11	4	8	11	9	10	7	17	9	5	5	10	12	8	9	12	10	9	5
23	7	0	0	19	11	1	8	14	10	7	15	28	2	0	1	23	6	2	3	20	7	3	6	17	12	2	1
9	17	4	10	11	19	1	7	16	13	2	7	9	13	8	17	23	6	2	5	10	12	8	12	16	9	6	7
16	13	1	5	16	15	0	5	12	14	5	6	4	15	11	14	7	14	10	8	3	9	18	12	4	6	21	19
(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	7	23	1	13	19	9	2	10	24	6	1	3	21	5	4	2	19	10	2	1

[7] Station closed December 31, 1886.
[8] For 27 days.
[9] For 29 days.
[10] For 23 days.
[11] Incomplete.
[12] For 20 days.

Number of clear, fair, cloudy, and rainy days at stations of the Signal

Original stations.	January.				February.				March.				April.				May.			
	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.
Greencastle, Ind[1]	3	12	16	18	6	10	12	10	7	13	11	16	9	12	9	12	8	18	5	12
Hatteras, N. C	10	13	8	14	15	8	5	9	14	10	7	9	13	9	8	7	16	10	5	9
Helena, Mont	4	18	9	11	6	16	6	7	10	15	6	14	6	15	9	8	7	21	3	2
Huron, Dak	8	18	5	13	6	17	5	4	4	16	11	9	9	12	9	11	8	20	3	12
Indianapolis, Ind	2	11	18	17	6	11	11	9	7	12	12	16	8	13	9	11	7	17	7	12
Indianola, Tex[2]	12	11	8	9	15	7	6	7	6	14	11	12	10	10	10	6	16	15	0	2
Jacksonville, Fla	5	11	15	10	12	10	6	7	3	16	12	19	14	10	6	9	15	11	5	5
Keeler, Cal	20	8	3	7	23	5	0	1	22	8	1	1	25	4	1	1	25	5	1	0
Keokuk, Iowa	6	12	12	14	10	14	4	9	10	11	10	11	8	15	7	12	15	11	5	9
Key West, Fla	3	18	10	8	10	15	3	3	[3]13	[3]12	[3]4	[3]6	(4)	(4)	(4)	[5]10	13	14	4	3
Kitty Hawk, N. C[6]	5	17	9	16	15	10	3	9	14	10	7	9	13	11	6	8	10	15	6	10
Knoxville, Tenn	6	8	17	21	11	5	12	7	5	14	11	14	7	10	13	13	7	20	4	14
La Crosse, Wis	6	13	12	22	8	10	10	10	10	10	11	15	11	7	12	13	13	17	1	9
Lamar, Mo	9	7	15	14	[7]12	[7]10	[7]5	[7]8	7	10	14	13	11	9	10	10	15	15	1	4
Las Animas, Colo	8	16	7	11	11	13	4	2	11	15	5	8	7	14	9	9	13	17	1	3
Leavenworth, Kans	9	7	14	15	12	9	7	7	9	11	11	10	6	10	14	13	14	12	5	11
Little Rock, Ark	6	11	14	13	14	7	7	8	8	10	13	16	8	11	11	13	9	17	5	5
Los Angeles, Cal	13	6	12	10	20	4	4	2	14	11	6	8	13	10	7	4	14	14	3	0
Louisville, Ky	5	12	14	19	10	11	7	9	10	8	13	12	10	10	10	18	9	16	6	14
Lynchburgh, Va	4	15	12	15	9	13	6	7	7	14	10	11	8	12	10	12	7	18	6	16
Mackinaw City, Mich	4	13	14	20	7	11	10	15	7	12	12	15	10	14	6	9	7	20	4	9
Macon, Fort, N. C[6]	10	12	9	14	14	11	3	9	13	11	7	11	11	11	8	10	14	13	4	10
Maginnis, Fort, Mont	5	13	13	14	2	13	13	17	6	13	12	17	9	13	8	11	5	20	6	12
Marquette, Mich	2	5	24	26	4	9	15	15	9	10	12	13	11	10	9	14	8	15	8	11
Memphis, Tenn	4	13	14	14	16	6	6	10	9	11	11	11	12	10	8	15	18	9	4	11
Milwaukee, Wis	1	15	15	25	5	14	9	14	8	11	12	17	8	12	10	12	13	15	3	9
Mobile, Ala	6	13	12	13	11	12	5	6	10	10	11	20	13	12	5	10	16	12	3	5
Montgomery, Ala	6	12	13	11	10	8	10	5	7	13	11	10	15	7	8	9	15	13	3	6
Montrose, Colo	10	7	14	12	12	13	3	4	6	19	6	12	9	10	11	13	17	14	0	3
Moorhead, Minn	8	15	8	10	5	14	9	11	5	15	11	6	7	15	8	14	12	15	4	11
Mount Washington, N. H	10	15	6	20	10	16	2	11	10	13	8	21	10	15	5	11	13	17	1	13
Nantucket, Mass	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nashville, Tenn	4	7	20	14	11	9	8	10	4	16	11	10	7	12	11	12	7	21	3	10
New Haven, Conn	7	13	11	15	9	13	6	11	8	12	11	13	5	14	11	12	9	10	12	13
New London, Conn	5	17	9	17	7	16	5	13	3	15	13	15	6	20	4	11	7	11	13	11
New Orleans, La	7	17	7	9	10	11	7	4	7	12	12	13	10	14	6	7	15	13	3	6
New York City	9	12	10	12	13	12	3	9	10	13	8	11	9	15	6	9	8	14	9	13
Norfolk, Va	10	14	7	15	15	11	2	10	12	13	6	8	9	13	8	8	9	14	8	16
North Platte, Nebr	10	19	2	6	17	6	5	5	8	16	7	7	7	15	8	11	8	20	3	11
Olympia, Wash	3	10	18	21	2	9	17	17	11	10	10	18	6	10	14	16	11	10	10	12
Omaha, Nebr	8	16	7	15	16	9	3	5	8	12	11	7	9	15	6	10	11	17	3	13
Oswego, N. Y	2	2	27	18	3	5	20	14	4	9	18	12	8	15	7	12	10	13	8	8
Palestine, Tex	14	9	8	11	12	9	7	9	10	10	11	11	13	9	8	10	16	13	2	2
Pensacola, Fla	7	17	7	14	13	9	6	7	9	11	11	18	12	13	5	10	16	13	2	2
Philadelphia, Pa	[8]7	[8]12	[8]11	[8]13	11	13	4	8	8	15	8	12	5	14	11	7	8	12	11	17
Pike's Peak, Colo	13	13	5	13	14	12	2	8	13	15	3	15	11	12	7	15	21	9	1	7
Pittsburg, Pa	11	13	17	17	4	13	11	15	4	17	10	13	8	13	9	13	5	19	7	12
Poplar River, Mont	8	16	7	10	3	15	10	10	6	17	8	9	15	11	4	6	11	18	2	7
Port Angeles, Wash	2	12	17	19	1	12	15	17	8	11	12	16	3	16	11	14	7	16	8	8
Port Huron, Mich	2	8	21	21	3	13	12	13	7	14	10	15	11	12	7	10	8	18	5	10
Portland, Me	5	14	12	17	8	13	7	9	5	14	12	17	11	12	7	5	7	14	10	13
Portland, Oregon	4	10	17	21	4	12	12	12	12	10	9	14	6	12	12	15	9	8	14	10
Prescott, Ariz	15	8	8	11	20	7	1	5	19	11	1	7	22	7	1	8	20	10	1	2
Red Bluff, Cal	14	9	8	12	17	10	1	1	12	8	11	11	10	7	13	13	12	12	7	6
Rio Grande City, Tex	14	8	9	4	13	7	8	4	9	11	11	6	7	16	7	3	20	9	2	3
Rochester, N. Y	0	6	25	21	2	7	19	19	4	8	19	18	4	16	10	14	8	16	7	7
Roseburg, Oregon	4	12	15	20	5	12	11	12	10	9	12	13	9	12	9	13	10	11	10	5
Sacramento, Cal	14	11	6	13	17	11	0	3	14	12	5	12	13	12	5	12	23	6	2	2
Saint Louis, Mo	8	13	10	13	13	9	6	8	7	11	13	12	7	12	11	12	12	16	3	13
Saint Michaels, Fort, Alaska[9]	17	5	9	6	12	9	7	10	8	13	10	9	9	9	12	4	0	6	25	17
Saint Paul, Minn	4	18	9	18	7	11	10	8	7	17	7	12	6	11	13	10	10	18	3	7
Saint Vincent, Minn	12	15	4	12	6	18	4	12	9	12	10	7	10	7	13	10	8	19	4	10
Salt Lake City, Utah	8	10	13	16	10	11	7	9	9	13	9	13	4	18	8	11	[8]11	[8]15	[8]4	[8]1
San Antonio, Tex	13	10	8	4	10	9	9	6	8	5	18	10	7	9	14	8	9	16	6	3
San Diego, Cal	12	9	10	11	18	5	5	5	12	18	1	9	11	13	6	6	9	19	3	0
Sandusky, Ohio	4	8	19	19	4	13	11	11	6	16	9	11	9	14	7	6	10	16	5	13
Sandy Hook, N. J[10]	10	14	7	14	10	16	2	9	11	14	6	14	10	14	6	14	11	10	10	19
Sanford, Fla	7	13	11	11	11	12	5	5	5	16	10	17	15	10	5	9	14	14	3	4
San Francisco, Cal	10	9	12	14	16	8	4	4	15	11	5	13	8	15	7	13	15	11	5	3
Santa Fé, N. Mex	8	10	13	10	21	4	3	5	23	7	1	6	15	12	3	7	22	7	2	3
Savannah, Ga	10	13	8	9	12	9	7	9	7	16	8	14	13	12	5	8	18	9	4	6
Shaw, Fort, Mont[11]	11	17	3	12	11	14	3	4	10	19	2	7	11	14	5	9	16	14	1	5

[1] Station closed Nov. 10, 1886.
[2] Station closed Aug 20, 1886.
[3] For 29 days.
[4] Incomplete.
[5] For 19 days.
[6] Station closed Dec.31, 1886.
[7] For 27 days.
[8] For 30 days.
[9] Station closed June 30, 1886.
[10] Station closed Nov. 30, 1886.
[11] Station closed Oct. 27, 1886.

Service U. S. Army, for each month of the year 1886, *etc.*—Continued.

June.				July.				August.				September.				October.				November.				December.			
Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.
12	16	2	11	19	11	1	6	11	15	5	13	12	13	5	11	20	7	4	5	...	...	...	...	...	...	...	...
9	11	10	16	13	12	6	10	6	17	8	18	15	10	5	4	15	12	4	4	17	10	3	8	9	15	7	11
9	16	5	12	12	15	1	8	25	8	0	1	15	9	6	7	8	14	9	10	8	13	9	8	4	14	13	10
15	10	5	11	13	15	3	11	10	18	3	12	10	15	5	10	18	9	4	6	10	12	8	9	10	18	3	10
9	13	8	13	14	12	5	7	11	12	8	13	7	18	5	10	20	7	4	4	7	14	9	12	10	10	11	14
8	20	2	10	10	19	2	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	22	5	16	2	17	12	26	6	18	7	15	8	15	7	14	13	12	6	10	23	5	2	3	10	13	8	12
30	0	0	0	28	3	0	2	25	6	0	1	30	0	0	0	24	6	1	1	23	6	1	2	16	14	1	0
16	11	3	5	23	8	0	2	18	10	3	10	12	13	5	12	17	11	3	5	10	13	7	9	13	14	4	7
6	13	11	16	1	16	14	14	5	20	6	14	5	18	7	12	8	14	9	10	7	18	5	3	9	19	3	4
7	14	9	13	12	15	4	11	6	15	10	17	11	12	7	14	15	14	2	0	13	12	5	8	7	18	6	13
4	12	14	17	8	16	7	12	8	16	7	13	12	11	7	6	19	7	5	4	10	10	10	11	9	15	17	15
10	16	4	10	14	16	1	7	11	18	2	7	4	19	7	11	14	13	4	6	8	14	8	8	8	13	10	10
10	13	7	8	17	10	4	4	15	14	2	5	12	13	5	9	18	12	1	6	15	10	5	6	15	10	6	7
11	17	2	4	15	12	4	10	15	4	2	5	16	10	4	4	16	14	1	3	21	7	2	3	16	12	2	3
10	16	4	13	17	12	2	2	15	15	1	5	12	13	5	7	19	7	5	6	12	14	4	5	12	13	6	7
6	12	12	16	9	16	6	12	12	15	4	8	12	13	5	10	16	14	1	3	12	12	6	13	12	7	12	12
[1]10	[1]16	[1]3	[1]1	15	14	2	1	21	8	2	1	15	15	0	0	15	14	2	1	22	7	1	1	18	12	1	1
6	11	13	15	18	19	4	7	9	18	4	13	12	12	6	8	19	8	4	5	7	13	10	13	9	10	12	15
3	13	14	18	10	15	6	13	6	16	9	14	11	11	8	9	19	10	2	4	9	15	6	9	6	11	14	14
10	17	3	10	16	12	3	6	17	9	5	9	6	15	9	17	11	11	9	10	2	15	13	18	2	16	13	14
7	13	10	12	5	19	7	16	4	17	10	17	12	13	5	8	21	9	1	3	15	13	2	4	9	10	12	12
3	18	9	15	[1]8	[1]17	[1]4	[1]9	13	15	3	6	13	14	3	5	12	13	6	5	7	15	8	11	5	16	10	12
7	17	6	14	10	20	1	9	8	16	7	12	5	11	14	3	11	12	8	10	3	12	15	17	2	11	18	18
6	13	11	15	20	11	0	7	15	13	3	12	[1]14	[1]11	[1]4	[1]10	25	5	1	4	10	14	6	15	9	13	9	14
13	15	2	8	13	16	2	7	10	15	6	8	5	17	8	12	12	13	6	6	7	14	9	14	6	15	10	13
7	17	6	20	8	21	2	16	8	21	2	12	12	18	0	7	21	9	1	2	19	12	6	8	9	12	10	6
4	11	15	16	8	18	5	6	6	19	6	11	11	15	4	4	21	6	4	1	12	8	10	11	10	13	8	9
19	11	0	1	14	16	1	5	10	18	3	9	21	8	1	5	14	15	2	7	17	7	6	7	15	10	6	4
13	12	5	10	12	18	1	4	13	16	2	7	6	19	5	8	8	11	12	8	7	12	11	7	4	17	10	11
7	20	3	17	11	18	2	15	9	20	2	14	14	12	4	16	13	14	4	17	11	16	3	19	9	19	3	20
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	11	9	11	4	13	14	19
5	14	11	16	15	15	1	7	6	20	5	15	14	12	4	5	21	7	3	3	11	9	10	12	4	14	13	12
9	15	6	10	8	15	8	11	10	15	6	11	5	16	9	12	13	9	9	9	8	14	8	10	7	13	11	14
4	16	10	10	5	15	11	10	8	19	4	11	5	18	7	8	9	14	8	10	9	13	8	11	10	9	12	14
7	16	7	21	9	16	6	17	11	19	1	13	9	16	5	13	21	10	0	2	12	11	7	9	12	12	7	10
10	12	8	9	15	10	6	10	14	14	3	6	6	17	7	7	15	8	8	7	12	10	8	9	10	11	10	13
6	13	11	17	12	10	9	12	6	12	13	17	11	13	6	8	15	12	4	3	10	14	6	9	7	11	13	15
10	18	2	8	15	14	2	4	17	14	0	9	20	9	1	3	17	13	1	3	16	12	2	4	15	13	3	6
10	10	10	10	13	12	6	8	16	10	5	4	16	8	6	6	7	11	13	15	3	18	9	12	1	10	20	27
12	16	2	9	18	9	4	1	13	12	6	8	8	16	6	18	13	12	6	6	11	12	7	6	11	12	8	6
11	11	8	10	15	8	8	12	8	16	7	7	10	11	9	15	9	8	14	12	0	9	21	17	2	6	23	14
10	15	5	9	12	13	5	12	16	13	2	6	11	10	9	9	19	9	3	5	12	12	6	8	14	7	10	7
8	17	5	14	5	23	3	20	9	17	5	15	10	17	3	10	22	6	3	3	13	11	6	8	12	7	12	10
[1]9	[1]11	[1]9	[1]8	10	13	8	12	11	13	7	6	[1]11	[1]10	[1]8	[1]9	16	7	8	6	14	8	8	10	9	12	10	12
11	19	0	19	14	17	0	19	7	21	3	23	20	10	0	6	17	13	1	8	20	9	1	10	18	11	2	8
9	16	5	12	11	15	5	12	9	13	9	9	14	13	3	12	16	8	7	7	7	11	12	17	6	12	13	14
8	18	4	5	14	17	0	5	19	11	1	7	13	16	1	4	13	13	5	4	11	13	6	7	7	18	6	11
7	14	9	8	16	9	6	7	13	14	4	6	17	6	7	9	6	15	10	13	4	18	8	12	1	16	14	28
13	11	6	12	16	9	6	11	14	11	6	11	8	15	7	12	10	11	10	9	5	13	12	11	4	19	8	14
9	11	10	11	9	18	4	9	13	15	3	9	12	10	8	15	11	12	8	10	7	10	13	13	7	13	11	14
9	11	10	7	17	4	10	5	22	4	5	2	16	8	6	7	9	13	9	14	8	14	8	9	1	12	18	24
26	4	0	0	14	15	2	6	8	20	3	16	26	4	0	3	22	8	1	4	25	4	1	2	21	9	1	0
26	4	0	0	[2]25	[2]5	[2]0	[2]0	28	3	0	0	28	2	0	0	16	8	7	7	17	12	1	2	6	12	13	11
8	17	5	9	21	9	1	4	18	12	1	5	4	15	11	16	22	7	2	1	14	10	6	5	22	8	1	1
8	14	8	10	9	14	8	9	9	15	7	8	6	14	10	13	8	10	13	6	2	10	18	17	0	10	21	15
14	12	4	2	12	13	6	5	20	10	1	0	20	9	1	3	7	11	13	19	9	12	9	14	4	13	14	24
30	0	0	0	30	1	0	0	31	0	0	0	30	0	0	0	22	9	0	3	26	3	1	1	12	11	8	6
11	15	4	12	19	12	0	3	10	19	2	9	10	16	4	11	17	10	4	5	11	8	11	12	8	12	11	10
2	11	17	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	16	3	12	9	22	0	6	13	16	2	8	3	17	10	12	13	11	7	4	8	17	5	11	8	19	4	8
10	12	8	9	13	18	0	9	17	13	1	4	11	12	8	7	11	12	8	6	10	13	7	7	10	18	3	5
17	13	0	4	16	15	0	0	14	12	5	5	22	7	1	2	15	11	4	8	13	6	11	13	7	17	7	12
9	12	9	9	8	15	8	8	7	20	4	5	7	15	8	15	12	15	4	4	11	8	11	5	[1]16	[1]11	[1]3	[1]3
3	15	12	1	4	25	2	0	12	17	2	0	2	26	2	0	11	16	4	1	21	7	2	3	15	9	7	2
12	12	6	11	14	12	5	5	10	14	7	12	11	14	5	11	14	6	11	8	6	11	13	8	6	12	13	15
13	11	6	13	12	15	4	8	15	11	5	7	8	19	3	7	10	15	6	7	10	11	9	11	...	...	...	...
9	18	3	18	3	19	9	25	12	12	7	15	14	12	4	15	9	11	11	17	15	15	0	2	8	13	10	12
18	10	2	0	14	14	3	1	11	14	6	0	14	12	4	1	16	11	4	5	20	9	1	3	[1]8	[1]10	[1]12	[1]7
20	10	10	5	19	10	2	9	15	14	2	18	19	6	5	10	22	8	1	4	22	6	2	3	25	5	1	2
4	17	9	16	3	22	6	22	6	17	8	12	9	17	4	12	17	10	4	7	14	3	3	5	11	11	9	11
8	15	7	16	14	15	2	8	23	7	1	4	15	11	4	5	[3]11	[3]6	[3]10	[3]10	...	...	...	...	...	...	...	...

[1] For 29 days.
[2] For 30 days.
[3] For 27 days.

Number of clear, fair, cloudy, and rainy days at stations of the Signal

Original stations.	January.				February.				March.				April.				May.			
	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.
Shreveport, La	10	10	11	10	10	10	8	7	11	6	14	14	10	9	10	12	20	9	2	2
Sill, Fort, Ind T	13	11	7	4	17	7	4	6	17	9	5	8	14	11	5	5	24	6	1	1
Sitka, Alaska	14	6	11	13	2	7	19	26	1	11	19	29	4	11	15	20	8	9	14	11
Smithville, N. C.[1]	7	12	12	11	15	9	4	8	13	11	7	11	13	11	6	9	18	10	3	11
Spokane Falls, Wash	7	10	14	14	14	10	4	7	13	12	6	5	11	12	7	13	18	8	5	5
Springfield, Ill	5	15	11	11	11	10	7	8	7	13	11	12	7	14	9	8	9	15	7	9
Stanton Fort, N. Mex	17	11	3	3	19	9	0	3	20	10	1	3	22	7	1	4	([2])	([2])	([2])	([2])
Stockton, Fort, Tex.[3]	([4])	([4])	([4])	([4])	15	8	5	3	14	15	2	2	19	11	0	2	26	5	0	1
Sully, Fort, Dak	8	17	6	11	6	13	9	4	6	14	11	7	8	18	4	8	6	23	2	8
Tatoosh Island, Wash	2	10	19	23	2	4	22	20	8	9	14	19	4	13	13	22	3	15	13	20
Thomas, Fort, Ariz	14	8	9	11	20	7	1	5	23	7	1	2	24	5	1	1	24	6	1	0
Toledo, Ohio	3	11	17	21	2	15	11	12	8	13	10	12	8	14	8	7	10	17	4	11
Totten, Fort, Dak	12	14	5	12	6	14	8	11	10	12	9	10	12	6	12	8	10	18	3	11
Unalashka, Alaska[5]	2	7	22	26	0	4	24	23	2	11	18	23	0	13	17	26	[6]0	[6]8	[6]14	[6]9
Valentine, Nebr	6	18	7	5	7	12	9	7	6	16	9	7	7	10	13	11	5	20	6	12
Vicksburg, Miss	6	12	13	11	10	10	8	8	7	12	12	14	9	14	7	13	14	15	2	4
Walla Walla, Wash	14	14	13	18	9	9	10	9	7	15	9	7	8	15	7	10	12	16	3	4
Washington City	5	17	9	15	8	16	4	7	11	12	8	10	8	11	11	9	9	10	12	18
Wilmington, N. C	4	13	14	12	15	9	4	8	12	14	5	11	[7]11	[7]13	[7]5	[7]8	11	16	4	10
Winnemucca, Nev	12	12	7	11	19	7	2	6	9	18	4	11	13	11	6	11	17	13	1	2
Yankton, Dak	8	15	8	9	12	12	4	8	9	10	12	10	10	13	7	8	8	22	1	13
Yuma, Ariz	15	9	7	5	16	11	1	2	22	7	2	3	27	3	0	1	18	9	4	0

[1] Station closed October 31, 1886.
[2] No record.
[3] Station closed June 20, 1886.
[4] Incomplete.
[5] Station closed May 22, 1886.
[6] For 22 days.
[7] For 29 days.

Service, U. S. Army, for each month of the year 1886, *etc.*—Continued.

June.				July.				August.				September.				October.				November.				December.			
Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.	Clear.	Fair.	Cloudy.	Rainy.
6	16	8	13	17	10	4	11	23	8	0	5	14	12	4	10	19	12	0	4	10	13	7	10	14	8	9	12
17	11	2	6	18	11	2	4	16	13	2	7	15	10	5	7	20	7	4	7	16	9	5	3	21	6	4	1
1	14	15	18	5	11	15	15	0	12	19	17	1	9	20	25	1	12	18	28	1	8	21	29	10	11	10	13
7	16	7	15	10	14	7	15	6	13	12	16	13	12	5	8	20	8	3	3	...	...	...	...	...	...	...	...
14	10	6	5	19	10	2	4	27	8	1	3	21	8	1	6	15	8	8	11	15	12	3	8	2	11	18	23
13	12	5	11	17	13	1	1	14	16	1	10	10	15	5	8	20	7	6	4	8	13	9	7	10	13	8	11
19	9	2	11	18	11	2	13	15	14	2	12	18	4	8	9	23	5	8	6	22	7	1	3	24	7	0	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	18	0	9	14	14	3	8	18	11	2	8	16	10	4	4	21	9	1	3	12	13	5	8	7	13	11	6
4	17	9	14	5	15	11	9	13	9	9	11	11	13	6	11	9	12	10	17	7	11	12	18	0	7	24	31
[1]19	[1]5	[1]0	[1]0	12	16	3	1	[2]12	[2]17	[2]1	[2]7	21	8	1	6	24	6	1	4	23	5	2	3	29	2	0	1
9	17	4	7	15	12	4	5	8	17	6	11	6	19	5	16	14	10	7	5	4	13	13	12	7	9	15	15
10	15	5	15	14	16	1	8	15	16	0	9	13	12	5	7	9	11	11	9	13	12	5	7	7	20	4	8
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	13	9	13	12	15	4	10	14	12	5	6	15	11	4	7	16	10	5	2	10	12	8	8	7	13	11	9
15	8	7	18	11	18	2	7	15	15	1	9	11	13	6	9	22	6	3	4	9	12	9	13	9	11	11	8
10	11	9	10	17	12	2	1	30	1	0	1	22	8	0	2	11	15	5	16	10	14	6	6	2	18	11	17
6	17	7	11	7	18	6	12	13	12	6	9	5	20	5	8	19	6	6	8	11	11	8	9	9	10	12	13
5	13	12	16	8	15	8	17	7	14	10	16	12	15	3	7	19	10	2	2	15	12	3	4	12	8	11	12
22	7	1	2	22	9	0	3	24	6	1	0	27	2	1	0	10	17	4	9	18	11	1	6	8	16	7	8
12	15	3	7	12	17	2	8	10	17	4	9	14	10	6	11	16	10	5	2	11	13	6	9	9	13	9	11
30	0	0	0	21	9	1	0	16	9	6	4	30	0	0	0	27	4	0	2	23	7	0	1	28	3	0	0

[1] For 24 days. [2] For 30 days.

APPENDIX No. 40.

Monthly maximum and minimum temperatures (in degrees Fahrenheit) and the precipitation in inches and hundredths at the third order stations of the Signal Service, U. S. Army, for the year 1886.

Stations of the third order.	January. Temperature. Maximum.	January. Temperature. Minimum.	January. Precipitation.	February. Temperature. Maximum.	February. Temperature. Minimum.	February. Precipitation.	March. Temperature. Maximum.	March. Temperature. Minimum.	March. Precipitation.
	°	°	In.	°	°	In.	°	°	In.
Taking one observation daily at sunset:									
Ashland, Oregon	58	17	4.64	71	26	1.63	72	24	1.43
Astoria, Oregon	55	20	13.24	62	35	5.69	56	30	7.23
Bowie, Fort, Ariz	[2]68.2	[2]11	4.24	68.8	30	0.88	76.9	28	0.48
Cape Henlopen, Del	59.7	6.4	2.89	44.6	15.1	4.44	54	24.8	2.43
Coeur d'Alene, Fort, Idaho	45	—12	4.18	59	15	0.71	63	12	2.07
Edgartown, Mass	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])
Klamath, Fort, Oregon	51	—15	7.30	59	16	1.17	64	11	3.69
Lake View, Oregon	57	—2.5	3.15	72	21	1.26	73	14	0.95
Laramie, Fort, Wyo	52.2	—3.3	0.24	65	5.5	0.28	66.3	—12	1.20
Lava, N. Mex	66.6	8.0	0.13	[5]73.4	[5]13.8	0.38	[1]79.5	[1]19	0.06
Linkville, Oregon	54	—4	5.31	60	23	1.21	66.3	20.9	1.53
Maricopa, Ariz	74.1	10.5	1.32	84	33.4	1.65	87.1	35.5	1.71
McDowell, Fort, Ariz	77	12	3.35	85	30	1.00	88.5	29.5	1.50
Mission, Alaska	([12])	([12])	([12])	36	—27	0.20	43	—34	1.68
Narragansett Pier, R. I	56	—4	5.64	52	—6	10.64	55	4	5.14
Neah Bay, Wash	53	18	16.40	56	28.5	14.13	56	27	12.90
New River Inlet, N. C	[6]65.5	[6]5.0	[6]1.70	67.2	0.1	1.25	67.5	27.2	3.53
Ocean City, Md	54.6	5.0	2.63	57	—1.2	3.22	68.8	19.7	1.37
Phœnix, Ariz	82.3	11.5	1.32	89.6	21.6	1.25	93.0	23.6	0.86
Pysht, Wash	49	17	11.44	56	29	7.81	57	26	7.91
Reliance, Fort, Alaska	3	—80	0.39	25	—72	1.34	45	—36	0.14
Reno, Fort, Ind. T	57.4	—20	1.08	70	—7.3	1.56	87.8	16.9	0.98
San Carlos Agency, Ariz	70	17.3	2.88	75.6	24.8	1.29	8[illegible].9	29.4	0.82
Smithville, N. C	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])
Spokane, Fort, Wash	[11]43.4	[11]—12.7	1.86	57.5	15.0	0.41	75.8	19.4	0.79
Supply, Fort, Ind. T	58.2	—13	1.39	70.4	—4	0.79	82.4	12	0.51
Verde, Fort, Ariz	67.5	12.5	1.90	74.5	24	1.48	79	26.5	2.09
Vineyard Haven, Mass	([8])	([8])	([8])	([8])	([8])	([8])	([3])	([3])	([3])
Wash Woods, N. C	[4]44	[4]2	[4]0.17	[16]56	[16]5	[16]0.22	[7]70	[7]13	[7]2.61

Stations of the third order.	April. Temperature. Maximum.	April. Temperature. Minimum.	April. Precipitation.	May. Temperature. Maximum.	May. Temperature. Minimum.	May. Precipitation.	June. Temperature. Maximum.	June. Temperature. Minimum.	June. Precipitation.
	°	°	In.	°	°	In.	°	°	In.
Taking one observation daily at sunset:									
Ashland, Oregon	77	29	2.63	90	25	1.19	[1]94	[1]41	0.72
Astoria, Oregon	65	34	4.99	72	35	3.65	69	47	2.05
Bowie, Fort, Ariz	79.8	32.5	0.07	98	49.5	0.01	104	55	0.21
Cape Henlopen, Del	76.4	36.0	0.81	([3])	([3])	([3])	([3])	([3])	([3])
Coeur d'Alene, Fort, Idaho	83	29	1.65	86	24	1.56	88	39	0.98
Edgartown, Mass	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])
Klamath, Fort, Oregon	67	19	2.77	81	13	1.12	[6]81	[6]29	[6]0.83
Lake View, Oregon	[6]74	[6]24	[6]1.32	82.5	21.5	0.97	[6]89.5	[6]31.5	[6]1.02
Laramie, Fort, Wyo	([3])	([3])	([3])	94.1	24.1	0.16	([3])	([3])	([3])
Lava, N. Mex	87.6	30	([14])	100.8	40.5	0.00	105	48.9	0.20
Linkville, Oregon	69.4	24	1.50	84.1	23.7	1.37	89.1	37.6	1.18
Maricopa, Ariz	91.3	41	0.06	112.3	51	0.00	113.7	59.4	0.00
McDowell, Fort, Ariz	93	34.5	([14])	115.5	42	0.00	([3])	([3])	([3])
Mission, Alaska	50	—3	0.31	[7]63	[7]14	3.13	([3])	([3])	([3])
Narragansett Pier, R. I	81	30	3.62	64	38	3.55	60	43	1.77
Neah Bay, Wash	61	31.5	7.55	69	33	4.40	72.5	38	3.70
New River Inlet, N. C	78.2	39	1.42	82	46.8	0.37	([12])	([12])	([12])
Ocean City, Md	81	33.7	1.74	72.1	40.6	4.47	79.8	54	1.47
Phœnix, Ariz	95.6	29.6	0.29	112.2	40.8	0.00	113.3	45.8	0.00
Pysht, Wash	61	31	4.49	73	33	1.81	77	38	2.33
Reliance, Fort, Alaska	52	—30	0.08	[11]76	[11]16	0.69	([3])	([3])	([3])
Reno, Fort, Ind. T	84.1	22.8	3.20	101.4	42	0.35	101.1	40	3.13
San Carlos Agency, Ariz	86.6	34.0	0.14	108.4	44	0.00	109	53.4	0.00
Smithville, N. C	([3])	([1])	([3])	([3])	([3])	([3])	([3])	([3])	([3])
Spokane, Fort, Wash	74.8	26.2	1.23	([12])	29.3	1.28	([3])	41.6	0.94
Supply, Fort, Ind. T	84.4	15.4	3.72	96.4	38.4	0.10	96.4	51.4	4.50
Verde, Fort, Ariz	81.5	31	0.82	102.5	37	0.02	103.5	47	0.01
Vineyard Haven, Mass	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])
Wash Woods, N. C	78.0	40	2.04	[10]81	[10]49	[10]6.00	91	64	8.91

Willcox, Ariz	71	7	([12])	78.5	—14.5	([12])	83	21.5	0.15	90.5	22.5	0.01	105	32	0.00	105.5	48	([14])
Yates Fork, Dak	34.3	—32.6	1.12	58.3	—19.2	0.62	67.5	—15.2	1.09	76.7	10.9	0.89	96.3	32.2	1.58	94	41.3	2.05
Taking two observations daily at 8 and 11 p. m., 75th meridian time:																		
Atka, Alaska	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	61	32	7.08	60	28	7.07
Hoochnahoo, Alaska	([3])	([3])	([3])	([3])	([3])	([3])	49	18	34.10	56	24	0.48	64	25	0.64	72	36	0.57
Kenai, Alaska	([3])	—40	([14])	([3])	—32	([12])	([3])	— 9	([12])	([3])	8.0	([12])	([3])	22.0	([12])	([3])	([3])	([3])
Koskokvim, Alaska	[7]43	[9]58	0.22	36	—44	0.30	44	—31	0.95	48	—1	0.18	([12])	([12])	([12])	......	......	......
Nuduokayet, Alaska	[5]22	—76	0.20	21	—60	0.31	39	—38	0.66	52	14	0.04	68	11	1.51	([3])	([3])	([3])
Pyramid Harbor, Alaska	38	([3])	0.76	41	([3])	4.99	54	([3])	0.21	55	([3])	0.09	59	([3])	0.32	74	([3])	0.12
Tcha-tow-klin, Alaska	[10]17	—75	[2]0.19	27	—74	1.23	43	—42	0.36	54	-10	1.19	[15]60	[15]10	[15]0.47	......	......	......

[1] For 28 days.
[2] For 22 days.
[3] No record.
[4] For 16 days.
[5] For 26 days.
[6] For 25 days.
[7] For 27 days.
[9] For 30 days.
[10] For 23 days.
[11] For 29 days.
[12] Record incomplete.
[14] Inappreciable.
[15] For 19 days.
[16] For 21 days.

Monthly maximum and minimum temperatures (in degrees Fahrenheit) and the precipitation in inches and hundredths at the third order stations of the Signal Service, U. S. Army, for the year 1886—Continued.

Stations of the third order.	July. Temperature. Maximum.	July. Temperature. Minimum.	July. Precipitation.	August. Temperature. Maximum.	August. Temperature. Minimum.	August. Precipitation.	September. Temperature. Maximum.	September. Temperature. Minimum.	September. Precipitation.	October. Temperature. Maximum.	October. Temperature. Minimum.	October. Precipitation.	November. Temperature. Maximum.	November. Temperature. Minimum.	November. Precipitation.	December. Temperature. Maximum.	December. Temperature. Minimum.	December. Precipitation.	Annual precipitation.
Taking one observation daily at sunset:	°	°	In.	°	°	In.	°	°	In.	°	°	In.	°	°	In.	°	°	In.	In.
Ashland, Oregon	99	43	1.69	97	45	0.00	98	35	0.00	83	28	1.65	69	18	1.08	63	24	4.66	21.32
Astoria, Oregon	84	47	2.58	80	51	0.56	84	47	4.33	67	40	5.57	57	33	4.84	59	39	16.89	71.62
Bowie, Fort, Ariz	103	64	2.24	94	60	2.49	84.5	47.2	1.26	78	41	0.36	69.5	20	0.74	66.2	31.5	0.15	13.13
Cape Henlopen, Del	(3)	(3)	(3)	(3)	(3)	(3)	[4]90	[4]57	[4]0.00	76.0	45.6	2.77	74	35.6	1.39	49	12.1	2.23	......
Coeur d'Alene, Fort, Idaho	97	42	0.07	89	40	0.00	84	29	1.61	79	28	2.57	(3)	zero	1.61	47	10	4.29	21.30
Edgartown, Mass	(3)	(3)	(3)	[4]77.4	[4]58.4	(3)	80.2	56.1	(3)	[5]75.7	[5]45.9	1.80	68.4	28.1	1.46	51.6	12.2	5.20	......
Klamath, Fort, Oregon	93	26	1.39	89	28	0.02	86	18	0.00	74	11	1.54	60	4	0.70	51	15	6.55	27.08
Lake View, Oregon	[7]95	[7]30	0.11	92	24	0.00	87.5	28	0.00	75	20.5	1.51	63	12	0.65	53	16.5	3.13	14.07
Laramie, Fort, Wyo	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	81.5	22.3	0.35	[8]60.1	[8]—11.1	[8]3.23	61.1	—9.5	0.77	......
Lava, N. Mex	[9]110.2	[9]59.5	2.05	98.2	58.0	3.32	92	41	5.67	[10]78.8	[10]35	[10]1.15	[5]66.6	[5]12	(14)	67	18	(14)	13.05
Linkville, Oregon	[1]94.3	[1]36.9	1.51	[11]94.1	[11]41.0	0.00	[10]85	[10]30.4	[10]0.00	77.1	25.9	1.53	60.4	20.3	0.65	57.7	24.2	2.27	18.06
Maricopa, Ariz	115.4	72.4	0.16	113.5	71.4	0.08	106.3	53.1	0.06	99.2	40.2	0.70	83.2	27	0.21	77.2	29.7	0.11	6.12
McDowell, Fort, Ariz	115.2	64.1	0.00	117.5	52.3	0.62	108	58.5	(14)	97.2	37.8	0.27	84	21.5	0.44	80	27	0.30	......
Mission, Alaska	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Narragansett Pier, R. I	84	50	3.38	85	45	3.51	82	37	3.03	78	25	3.95	63	23	4.02	53	7	5.26	53.71
Neah Bay, Wash	80	42.5	4.60	71.5	46.0	3.70	69	40	5.95	66	31	7.40	58	26.5	11.80	59	28	30.70	123.23
New River Inlet, N. C	91.2	65	12.44	(12)	(12)	(12)	89	61	1.09	83.5	40	0.45	76.1	30.1	0.82	60.5	21.2	4.25	......
Ocean City, Md	[13]88.2	[13]65	[13]3.86	[13]86	[13]63	[13]1.33	83	51.5	2.58	76.5	43	1.71	[6]65.3	[6]27.9	[6]1.86	[1]51.7	[1]15.8	4.37	30.61
Phœnix, Ariz	113.4	58.6	0.05	113.9	66.8	0.59	(3)	(3)	0.45	(3)	(3)	0.58	(3)	(3)	0.32	85.1	32.1	0.07	5.78
Pysht, Wash	85	43.5	1.83	76	43	1.50	75	34	4.17	68	31	4.85	54.5	28	3.54	55.5	23	21.61	73.29
Reliance, Fort, Alaska	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	......
Reno, Fort, Ind. T	107.6	59	0.88	107.3	59.1	0.40	99.8	40.3	1.27	86.2	28	3.54	80	16.5	0.08	66.8	—2	0.04	16.51
San Carlos Agency, Ariz	112.6	65	0.03	110.8	65	3.49	100.8	51.7	0.87	72	35.3	0.46	80.5	18.1	0.46	72.1	20.1	0.00	10.44
Smithville, N. C	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	75.6	27	0.76	63	.19	3.14	......
Spokane, Fort, Wash	101.2	45.4	0.10	95.7	45	0.00	92.5	81.9	0.47	(3)	(3)	1.63	(12)	(12)	0.54	55	12	3.83	13.08
Supply, Fort, Ind. T	103	66.2	1.52	102.4	64.2	1.14	94.3	41.2	0.86	84.3	31.2	1.54	78.4	12.5	0.12	65.4	1.0	0.01	16.20
Verde, Fort, Ariz	106.2	60	0.18	101.0	65	3.18	92	51	0.20	89.3	33.0	0.13	76.8	14.0	0.55	69.0	22.5	0.60	11.16
Vineyard Haven, Mass	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	[6]64.8	[6]31.0	[6]3.02	56.6	(3)	3.28	......
Wash Woods, N. C	93	63	3.48	92	64	18.09	87	61	2.02	80	42	0.55	76	30	2.07	[6]73	[6]20	[6]2.62	43.81
Willcox, Ariz	111	59	0.37	108	60	2.14	99	41	1.68	92	25	0.36	89	12	0.58	82	15	0.08	......
Yates, Fort, Dak	107.3	53	4.70	104.2	31.7	4.83	95.2	24.0	0.80	87.8	17.4	0.50	58	—5	1.19	45	—25.6	0.60	19.97

Taking two observations daily at 3 and 11 p. m., 75th meridian time:																			
Atka, Alaska	76	36	2.01	72	39	6.30	......	......	......	......	......	......	......	......	......	......	......	......	......
Hoochnahoo, Alaska	75	42	1.54	72	39	4.05	62	36	5.85	55	27	9.85	46	18	8.25	47	8	5.55	......
Kenai, Alaska	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	......
Koskokvim, Alaska	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Nuduckayet, Alaska	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	......
Pyramid Harbor, Alaska	78	([3])	0.22	70	([3])	0.29	68	[5]30	0.89	56	26	1.07	45	12	0.70	43	1.0	0.18	9.84
Tcha-tow-klin, Alaska	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......

[1] For 28 days.
[2] For 22 days.
[3] No record.
[4] For 16 days.
[5] For 26 days.
[6] For 25 days.
[7] For 27 days.
[8] For 24 days.
[9] For 30 days.
[10] For 23 days.
[11] For 29 days.
[12] Record incomplete.
[13] For 20 days.
[14] Inappreciable.
[15] For 19 days.
[16] For 21 days.

APPENDIX No. 41.

Mean maximum and mean minimum temperatures (in degrees Fahrenheit), and the number of days .01 inch or more precipitation fell, at third-order stations of the Signal Service, U. S. Army, for each month of the year 1886.

Stations of the third order.	January.			February.			March.			April.			May.			June.		
	Temperature.			Temperature.			Temperature.			Temperature.			Temperature.			Temperature.		
	Maximum.	Minimum.	Precipitation.	Maximum.	Minimum.	Precipitation.	Maximum.	Minimum.	Precipitation.	Maximum.	Minimum.	Precipitation.	Maximum.	Minimum.	Precipitation.	Maximum.	Minimum.	Precipitation.
Taking one observation daily at sunset:	°	°	*Days.*	°	°	*Days.*	°	°	*Days.*	°	°	*Days.*	°	°	*Days.*	°	°	*Days.*
Ashland, Oregon	46.7	30.9	18	56.5	35.8	11	55.6	31.8	13	61.4	36.8	13	73.5	44.0	9	[1]80.7	[1]48.9	[1]3
Astoria, Oregon	44.1	34.9	24	50.3	39.9	18	50.1	37.9	20	54.4	42.0	19	60.2	46.1	16	63.7	51.9	10
Bowie, Fort, Ariz	[2]48.8	[2]26.9	8	54.8	38.3	3	59.7	38.0	3	70.6	43.8	1	87.1	61.1	1	92.6	64.7	2
Cape Henlopen, Del	35.2	30.2	13	32.1	27.0	9	46.1	38.0	12	58.0	47.0	8	(3)	(3)	(3)	(3)	(3)	(3)
Coeur d'Alene, Fort, Idaho	28.8	15.0	15	44.6	29.5	8	46.7	28.6	11	55.5	33.2	9	66.5	38.2	9	75.6	46.6	4
Edgartown, Mass	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Klamath, Fort, Oregon	36.5	17.8	19	49.9	26.5	9	45.4	22.2	13	53.2	27.4	14	65.6	34.3	6	[4]69.2	[4]38.5	[4]5
Lake View, Oregon	41.7	22.4	17	57.5	30.7	10	49.4	21.4	11	[4]56.0	[4]31.2	[4]12	68.0	39.9	8	[4]73.9	[4]43.8	[4]7
Laramie, Fort, Wyo	30.2	5.6	4	49.7	21.4	2	45.2	20.6	4	(3)	(3)	(3)	79.4	43.3	2	(3)	(3)	(3)
Lava, N. Mex	51.6	25.3	4	[5]61.0	[5]28.1	[5]3	[1]65.9	[1]31.1	[1]2	79.0	40.0	0	82.1	52.1	0	95.9	58.8	8
Linkville, Oregon	37.9	21.7	16	50.9	35.2	9	47.8	28.3	16	58.0	35.6	13	69.8	41.1	8	75.5	46.2	6
Maricopa, Ariz	64.4	38.7	9	75.1	42.6	3	72.4	42.8	4	81.6	49.4	3	100.3	65.8	0	106.6	67.7	0
McDowell, Fort, Ariz	63.5	35.7	10	73.8	38.4	3	70.1	36.4	3	75.1	40.9	0	88.2	54.0	0	(3)	(3)	(3)
Mission, Alaska	(6)	(6)	(6)	11.7	—7.3	8	20.6	—1.7	13	36.5	16.0	4	[7]47.2	[7]20.0	[7]14	(3)	(3)	(3)
Narragansett Pier, R. I	36.0	21.0	17	36.5	19.4	12	42.2	27.1	13	57.0	39.7	11	64.1	47.5	12	71.3	54.0	12
Neah Bay, Wash	43.8	31.6	21	49.0	38.9	22	49.6	35.6	17	54.4	39.6	18	60.6	42.7	13	65.8	47.0	11
New River Inlet, N. C	[4]47.9	[4]31.1	[4]9	54.5	35.9	8	58.2	42.1	10	60.4	53.2	6	76.6	60.7	3	(3)	(3)	(3)
Ocean City, Md	39.1	26.6	14	41.2	27.5	6	47.7	34.6	9	56.3	44.0	9	63.0	50.5	16	72.5	61.8	7
Phœnix, Ariz	67.7	33.2	10	78.0	35.8	3	79.4	35.3	2	88.0	41.9	3	90.8	50.4	0	106.9	53.9	0
Pysht, Wash	40.2	—30.9	23	48.4	37.6	16	50.0	34.0	18	55.7	38.3	17	63.7	42.9	14	66.9	46.5	9
Reliance, Fort, Alaska	—31.4	—47.4	3	—13.9	—34.2	10	21.4	—5.1	7	40.3	12.8	2	[8]57.7	[8]30.1	[8]8	(3)	(3)	(3)
Reno, Fort, Ind. T	35.7	47.5	15	52.1	27.3	7	62.5	34.9	13	72.3	44.5	9	88.9	58.0	4	86.2	62.5	6
San Carlos Agency, Ariz	54.5	34.4	9	67.4	37.6	5	67.4	36.1	6	78.8	42.2	2	96.5	58.5	0	103.0	62.5	0
Smithville, N. C	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Spokane, Fort, Wash	[8]26.5	[8]8.4	[8]18	46.5	27.4	7	51.8	29.9	6	62.9	37.0	18	(6)	43.3	8	(6)	51.5	8
Supply, Fort, Ind. T	35.8	12.3	12	48.2	26.0	7	58.7	32.4	10	69.1	40.6	9	86.1	56.5	7	86.1	65.8	12
Verde, Fort, Ariz	55.0	29.3	8	67.6	32.4	5	64.0	32.7	4	72.8	38.8	5	90.2	49.0	1	95.7	54.4	1
Vineyard Haven, Mass	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Wash Woods, N. C	[9]32.1	[9]15.4	[9]5	[10]37.1	[10]19.8	[10]6	[7]51.0	[7]34.9	[7]12	62.6	50.3	8	[11]71.2	[11]61.0	[11]0	84.1	69.3	12

Willcox, Ariz	55.6	28.0	([6])	68.8	27.9	([6])	68.1	28.6	4	77.8	33.8	1	95.3	46.3	0	99.7	51.6	0
Yates, Fort, Dak	7.3	-10.9	9	32.1	8.8	8	38.2	17.5	11	61.6	35.0	6	76.2	47.4	9	80.9	53.9	11
Taking two observations daily at 3 and 11 p. m., 75th meridian time:																		
Atka, Alaska	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	48.0	35.6	12	51.8	39.0	18
Hoochnahoo, Alaska	([3])	([3])	([3])	([3])	([3])	([3])	42.7	28.7	19	48.9	31.1	11	56.8	33.1	6	[12]62.8	[12]43.0	[12]4
Kenai, Alaska	([3])	-9.3	0	([3])	1.9	8	([3])	13.0	4	([3])	20.7	4	([3])	32.7	8	([3])	([3])	([3])
Koskokvim, Alaska	([3])	[13]-12.0	[13]2	3.7	-11.6	4	21.4	-0.5	7	33.7	16.6	4	([6])	([6])	([6])	([3])	([3])	([3])
Nuduckayet, Alaska	[5]-7.9	-32.2	5	-[5]7.6	-32.5	10	15.8	-12.0	7	35.5	5.1	1	51.4	29.7	12	([3])	([3])	([3])
Pyramid Harbor, Alaska	19.0	([3])	7	30.0	([3])	15	41.0	([3])	6	48.0	([3])	3	54.0	([3])	7	66.0	([3])	4
Tcha-tow-klin, Alaska	[11]-5.5	-37.2	8	[14]zero.	-36.4	9	19.9	-8.3	4	42.0	9.5	13	[14]51.9	[14]27.8	[14]6	([3])	([3])	([3])

[1] For 28 days.
[2] For 22 days.
[3] No record.
[4] For 25 days.
[5] For 26 days.
[6] Record incomplete.
[7] For 27 days.
[8] For 29 days.
[9] For 16 days.
[10] For 21 days.
[11] For 23 days
[12] For 24 days.
[13] For 30 days.
[14] For 19 days.

***Mean maximum and mean minimum temperatures (in degrees Fahrenheit), and the number of days .01 inch or more precipitation fell, at third-order stations of the Signal Service, U. S. Army, for each month of the year* 1886—Continued.**

Stations of the third order.	July.			August.			September.			October.			November.			December.			Annual precipitation.
	Temperature.			Temperature.			Temperature.			Temperature.			Temperature.			Temperature.			
	Maximum.	Minimum.	Precipitation.	Maximum.	Minimum.	Precipitation.	Maximum.	Minimum.	Precipitation.	Maximum.	Minimum.	Precipitation.	Maximum.	Minimum.	Precipitation.	Maximum.	Minimum.	Precipitation.	
Taking one observation daily at sunset:	°	°	Days.	°	°	Days.	°	°	Days.	°	°	Days.	°	°	Days.	°	°	Days.	Days.
Ashland, Oregon	86.5	52.9	8	86.9	51.7	0	80.6	45.6	0	63.1	38.3	11	51.2	30.5	10	51.0	35.0	20	116
Astoria, Oregon	68.1	55.1	11	68.1	55.6	8	66.4	53.8	13	57.4	46.0	21	49.1	39.4	20	51.9	43.1	21	217
Bowie, Fort, Ariz	92.8	69.4	10	86.3	65.5	11	78.6	59.6	4	72.4	45.3	3	57.3	36.7	3	61.8	40.8	1	50
Cape Henlopen, Del	([1])	([1])	([1])	([1])	([1])	([1])	[2]76.0	[2]67.0	[2]0	69.0	57.0	6	58.7	44.6	7	37.1	28.0	16	......
Coeur d'Alene, Fort, Idaho	85.1	52.5	1	82.2	47.9	0	71.5	41.5	4	58.7	35.8	13	([1])	25.4	8	36.5	29.1	22	104
Edgartown, Mass	([1])	([1])	([1])	[3]70.7	[3]62.2	([1])	70.5	63.5	([1])	[4]62.3	[4]57.5	[4]4	52.8	47.0	11	40.8	26.6	15	......
Klamath, Fort, Oregon	79.6	40.6	6	80.6	37.2	1	73.0	27.9	0	54.8	25.1	9	43.5	18.8	9	42.3	26.2	23	114
Lake View, Oregon	[5]82.5	[5]48.4	[5]2	84.7	43.8	0	75.9	41.9	0	55.0	33.8	12	45.6	23.0	6	44.7	30.1	17	102
Laramie, Fort, Wyo	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	66.8	32.9	7	[6]38.4	[6]18.9	[6]6	[5]40.6	[5]12.2	[5]2	......
Lava, N. Mex	[7]95.6	[7]65.2	[7]9	90.8	62.3	13	80.0	54.2	13	[8]72.4	[8]44.1	[8]6	[4]58.3	27.4	[4]0	58.6	24.8	0	530
Linkville, Oregon	[9]79.5	[9]49.4	[9]7	[10]83.4	[10]47.4	[10]2	[8]75.3	[8]38.9	[8]0	58.5	35.3	8	47.8	27.4	6	49.1	33.5	14	105
Maricopa, Ariz	110.7	81.7	5	105.6	80.1	3	100.0	69.1	1	84.3	53.7	2	70.5	38.7	1	74.5	36.0	1	82
McDowell, Fort, Ariz	110.7	72.1	0	107.3	68.4	5	100.6	64.7	0	84.5	49.0	3	69.4	35.1	1	71.2	35.0	1	......
M ssion, Alaska	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	......
Narragansett Pier, R. I	77.7	60.9	9	76.0	58.8	9	71.3	56.1	14	62.1	44.5	9	53.4	35.0	11	37.8	21.5	16	145
Neah Bay, Wash	67.5	53.5	8	67.5	51.4	7	64.0	49.5	7	57.6	42.4	11	51.9	36.4	17	53.9	41.5	29	181
New River Inlet, N. C	85.6	72.5	16	([11])	([11])	([11])	81.5	67.5	7	76.4	54.9	2	63.1	45.9	7	48.1	37.8	11	......
Ocean City, Md	[12]78.9	[12]68.2	[12]10	[12]77.8	[12]68.4	[12]5	75.1	65.8	3	66.9	54.7	4	[13]56.3	[13]42.3	[13]8	[9]42.2	[9]28.8	[9]12	103
Phœnix, Ariz	108.6	75.5	2	105.4	74.7	6	([1])	([1])	1	([1])	([1])	1	([1])	([1])	1	73.7	36.9	1	80
Pysht, Wash	67.3	48.7	9	64.9	48.5	5	61.4	44.4	8	52.9	39.9	12	46.2	34.8	16	42.2	38.5	30	177
Reliance, Fort, Alaska	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	......
Reno, Fort, Ind. T	95.8	67.3	10	97.7	68.3	5	88.4	61.7	9	75.7	50.5	7	62.3	34.2	4	49.1	14.9	1	90
San Carlos Agency, Ariz	107.2	72.2	3	100.3	72.5	13	91.9	62.2	3	80.1	44.1	3	64.7	32.7	3	63.9	28.6	0	47
Smithville, N. C	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	64.5	43.7	3	53.7	37.4	10	......
Spokane, Fort, Wash	89.8	55.6	4	88.7	52.6	0	78.5	43.5	5	([1])	([1])	11	([11])	([11])	10	37.9	27.8	21	111
Supply, Fort, Ind. T	91.2	71.3	8	93.5	76.0	7	85.7	65.0	5	76.6	52.4	4	60.6	31.1	2	45.1	21.7	3	86
Verde, Fort, Ariz	101.8	67.4	3	89.7	69.7	11	85.9	59.0	3	77.2	44.5	4	63.4	27.6	2	61.6	29.1	1	48
Vineyard Haven, Mass	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])	[13]54.4	[13]34.8	[13]10	42.6	([11])	14	......
Wash Woods, N. C	86.2	70.1	9	84.5	69.2	15	79.9	67.2	4	72.8	56.9	2	65.1	47.0	8	[13]55.4	[13]34.1	[13]10	100
Willcox, Ariz	103.2	64.6	3	98.7	64.1	11	89.1	51.7	7	82.3	38.4	8	68.0	28.3	4	69.4	22.3	1	......
Yates, Fort, Dak	93.1	63.4	7	86.3	58.4	10	74.3	43.5	5	63.7	36.2	9	41.3	16.5	8	16.8	− 2.4	13	106

Taking two observations daily at 3 and 11 p. m., 75th meridian time:																			
Atka, Alaska	60.5	44.0	4	59.5	47.7	12	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]
Hoochnahoo, Alaska	68.3	47.2	5	64.7	45.5	10	55.0	42.0	15	48.0	36.0	16	41.5	29.2	15	36.8	24.1	13	[1]
Kenai, Alaska	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]
Koskokvim, Alaska	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]
Nuduckayet, Alaska	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]
Pyramid Harbor, Alaska	72.0	[1]	2	65.0	[1]	6	57.0	46.0	8	48.0	36.0	11	38.0	28.0	11	32.0	22.0	3	83.0
Tcha-tow-klin, Alaska	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]

[1] No record.
[2] For 16 days.
[3] Observations commenced August 14.
[4] For 26 days.
[5] For 27 days.
[6] For 24 days.
[7] For 30 days.
[8] For 23 days.
[9] For 28 days.
[10] For 29 days.
[11] Record incomplete.
[12] For 20 days.
[13] For 25 days

APPENDIX No. 42.

Dates of closing and opening of navigation on the lakes and rivers, at selected stations of the Signal Service, U. S. Army, for the winter of 1886-'87.

Stations.	Lakes or rivers.	Navigation.	
		Closing.	Opening.
Albany, N. Y	Hudson River	Dec. 4	Apr. 6
Alpena, Mich	Lake Huron	Dec. 16	Apr. 18
Baltimore, Md	Patapsco River	(1)	(1)
Bismarck, Dak	Missouri River	Nov. 17	Mar. 26
Buffalo, N. Y	Lake Erie	Dec. 15	Apr. 17
Buford, Fort, Dak	Missouri River	Nov. 14	Apr. 13
Cairo, Ill	Mississippi River	Dec. 1	Feb. 8
Chattanooga, Tenn	Tennessee River	(1)	(1)
Chicago, Ill	Lake Michigan	Dec. 16	Apr. 23
Cincinnati, Ohio	Ohio River	Jan. 5	Jan. 7
Cleveland, Ohio	Lake Erie	Dec. 26	Mar. 28
Custer, Fort, Mont	Big Horn River	Nov. 20	Mar. 13
Davenport, Iowa	Mississippi River	Nov. 24	Mar. 14
Detroit, Mich	Detroit River	Dec. 10	Apr. 16
Dubuque, Iowa	Mississippi River	Dec. 3	Mar. 12
Duluth, Minn	Lake Superior	Nov. 30	May 6
Erie, Pa	Lake Erie	Dec. 7	Mar. 15
Escanaba, Mich	Little Bay de Noquette	Dec. 6	Apr. 28
Keokuk, Iowa	Mississippi River	Nov. 18	Mar. 18
La Crosse, Wis	do	Nov. 29	Apr. 5
Leavenworth, Kans	Missouri River	Dec. 26	Feb. 17
Louisville, Ky	Ohio River	Jan. 4	Jan. 22
Mackinaw City, Mich	Mackinaw Straits	Dec. 27	Apr. 24
Marquette, Mich	Lake Superior	Dec. 1	May 5
Milwaukee, Wis	Lake Michigan	(1)	(1)
Moorehead, Minn	Red River	July 23	Apr. 12
Nashville, Tenn	Cumberland River	(1)	(1)
Omaha, Nebr	Missouri River	Nov. 30	Mar. 12
Oswego, N. Y	Lake Ontario	Dec. 9	Apr. 10
Pittsburgh, Pa	Monongahela River	(1)	(1)
Poplar River, Mont	Missouri River	(2)	Apr. 15
Port Huron, Mich	Lake Huron	Dec. 12	Apr. 12
Saint Louis, Mo	Mississippi River	Dec. 1	Jan. 29
Saint Paul, Minn	do	Nov. 10	Apr. 20
Saint Vincent, Minn	Red River	Nov. 24	Apr. 20
Sandusky, Ohio	Lake Erie	Dec. 2	Apr. 1
Sully, Fort, Dak	Missouri River	Oct. 10	Apr. 18
Toledo, Ohio	Lake Erie	Dec. 1	Apr. 4

[1] Navigation uninterrupted. [2] No record.

APPENDIX No. 43.

Monthly and annual mean temperatures (in degrees Fahrenheit) at stations on the Central Pacific and Southern Pacific Railroads and connecting branches for the year ending December 31, 1886.

[The daily mean is obtained by dividing the sum of the maximum and minimum temperatures by two; the monthly by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Anaheim, Cal	57.6	57.3	58.5	61.2	66.4	69.1	72.3	76.6	71.5	66.1	60.5	56.9	64.5
Antioch, Cal	49.0	52.7	51.5	60.0	67.2	76.1	78.3	74.5	67.6	62.2	52.6	52.4	62.0
Aptos, Cal	51.0	54.8	52.3	56.6	59.3	58.9	61.4	61.9	60.9	55.1	51.6	53.1	56.4
Athlone, Cal	50.9	57.4	55.6	(1)	69.6	75.9	78.8	82.0	75.0	67.6	57.9	53.2	.....
Auburn, Cal	44.0	51.9	47.8	53.4	61.5	72.4	76.7	77.5	70.5	55.2	47.9	48.1	58.9
Battle Mountain, Nev	31.6	40.3	38.4	47.2	63.3	69.2	76.3	75.1	57.2	42.9	26.7	33.7	50.2
Benson, Ariz	46.2	52.6	52.4	63.1	79.2	82.8	85.1	82.6	75.1	66.2	49.8	49.2	65.4
Beowawe, Nev	31.7	42.7	38.5	49.4	65.5	72.1	79.7	78.2	66.5	48.4	29.3	35.5	53.1
Bishop Creek, Cal	42.2	51.8	49.5	62.1	76.8	85.0	89.9	88.1	81.1	60.5	48.7	49.5	65.4
Blue Creek, Utah	24.6	35.9	37.3	51.9	65.9	71.7	82.1	78.6	68.1	50.3	30.6	34.2	52.6
Boca, Cal	30.0	38.1	36.6	46.5	52.5	57.5	62.7	62.7	54.8	45.0	28.4	34.1	45.7
Borden, Cal	45.9	52.4	52.9	60.1	73.6	81.8	85.7	86.4	77.1	60.8	48.5	46.5	64.3
Brentwood, Cal	49.8	59.3	59.7	63.6	71.2	80.1	82.4	80.9	69.3	62.8	52.6	(2)	.....
Brighton, Cal	49.3	56.3	55.9	61.4	67.2	77.7	81.4	81.4	74.9	65.5	52.6	53.8	64.8
Browns, Nev	37.2	44.8	43.3	54.8	68.6	74.7	80.8	80.4	67.3	52.8	34.8	41.4	56.7
Byron, Cal	46.9	54.8	57.5	63.7	73.3	81.8	85.6	82.2	75.8	64.0	52.7	51.2	65.8
Caliente, Cal	55.6	50.9	47.8	58.1	70.6	81.8	84.7	85.8	73.4	61.1	53.7	55.0	64.9
Calistoga, Cal	46.3	52.3	50.7	56.5	63.1	71.1	73.1	71.6	68.2	58.4	49.5	50.6	59.3
Carlin, Nev	29.7	38.6	36.9	46.3	60.1	67.5	74.8	75.0	57.8	45.4	31.1	34.7	49.8
Casa Grande, Ariz	55.3	59.8	63.3	71.8	86.7	93.5	95.5	93.2	87.1	67.8	56.7	55.9	73.9
Chico, Cal	48.5	57.1	54.7	60.2	70.5	84.0	89.0	85.1	77.9	62.5	52.9	52.6	66.3
Chualar, Cal	45.6	57.3	52.5	61.9	66.5	64.8	66.2	66.0	64.7	60.8	56.0	54.0	59.7
Cisco, Cal	30.8	37.3	31.7	35.0	47.3	57.2	62.4	60.5	54.6	40.1	34.7	35.4	43.9
Colfax, Cal	44.5	50.4	46.0	52.7	60.1	72.6	72.6	76.1	71.3	54.7	49.5	48.8	58.3
Colton, Cal	51.5	57.1	53.2	66.2	79.6	76.1	87.7	86.1	79.1	64.2	59.1	63.0	68.6
Corinne, Utah	26.9	37.7	37.8	52.0	67.6	74.6	84.8	81.5	64.0	64.2	29.5	33.1	54.5
Corning, Cal	45.0	52.8	51.8	60.0	67.9	80.6	81.4	79.7	73.6	66.0	50.2	51.6	63.4
Davisville, Cal	48.9	56.4	58.2	61.4	70.5	79.1	80.4	76.2	68.1	60.4	54.2	53.1	63.9
Delano, Cal	48.6	54.2	53.4	62.6	74.1	84.8	88.0	87.5	78.3	62.2	48.6	52.0	66.2
Delta, Cal	29.8	49.9	48.8	57.3	64.4	75.8	77.3	76.1	72.5	51.8	47.5	45.8	58.1
Deming, N. Mex	44.9	50.9	53.7	62.7	79.2	83.9	87.7	85.6	77.6	67.9	52.0	52.4	66.5
Dunnigan, Cal	46.4	50.5	52.4	59.9	71.1	82.7	84.5	81.2	76.5	64.5	52.3	51.7	64.5
Elko, Nev	27.9	38.9	38.1	50.5	65.2	73.1	79.9	77.2	59.2	43.6	34.2	32.3	51.7
Elmira, Cal	49.9	57.0	57.0	63.0	72.1	81.1	84.4	85.4	77.5	65.9	55.9	54.5	67.0
El Paso, Tex	46.4	49.8	53.0	51.5	76.4	83.4	85.9	83.6	81.2	65.7	48.0	48.6	64.5
Emigrant Gap, Cal	35.6	44.0	36.4	40.8	53.1	61.1	65.3	66.9	64.0	46.2	44.3	44.4	50.2
Farmington, Cal	49.0	57.9	53.3	62.0	69.4	77.7	80.4	77.2	72.8	61.8	52.3	50.9	63.7
Fresno City, Cal	50.6	54.9	54.9	62.0	72.2	80.0	84.2	85.6	77.4	61.0	57.4	50.9	65.9
Galt, Cal	47.2	53.6	54.0	58.3	68.1	76.0	78.0	76.3	70.1	58.6	50.2	49.5	61.7
Gilroy, Cal	48.7	55.5	55.9	58.6	62.7	69.3	72.5	71.5	65.3	57.9	51.5	53.2	60.2
Golconda, Nev	39.7	48.1	45.0	55.3	68.1	76.5	82.3	83.4	72.0	55.5	41.0	42.4	59.1
Goshen, Cal	47.3	52.7	51.4	61.8	74.1	84.3	88.9	88.7	77.5	61.4	48.3	47.4	65.3
Halleck, Nev	24.8	36.6	33.1	44.2	59.9	65.4	73.3	71.6	58.3	43.1	25.5	33.7	47.5
Hawthorne, Nev	38.3	44.6	42.1	51.5	61.0	68.6	82.3	84.4	69.3	45.8	38.8	42.5	55.8
Holliston, Cal	49.7	55.3	53.1	58.7	64.7	68.0	71.3	73.3	68.3	63.3	53.8	52.1	61.0
Hot Springs, Nev	33.1	42.4	43.1	49.5	61.8	71.3	80.5	77.5	67.2	49.8	33.0	36.0	53.8
Humboldt, Nev	36.5	(2)	41.7	49.4	59.6	64.6	72.3	68.2	61.3	50.8	35.7	40.9	....
Indio, Cal	54.3	(2)	62.9	71.1	88.8	92.5	96.5	90.6	83.9	74.4	63.4	62.2	....
Ione, Cal	46.2	53.1	47.9	55.2	65.7	77.4	77.5	76.0	67.4	54.7	47.1	49.8	59.8
Keeler, Cal	44.6	54.7	51.2	60.1	(2)	80.4	85.0	86.0	75.9	59.2	46.8	45.8	.....
Keene, Cal	49.7	58.4	51.3	56.6	67.8	76.6	80.9	80.8	73.7	58.5	52.2	49.1	63.0
Kelton, Utah	29.7	39.3	38.7	50.1	63.2	68.9	79.7	75.5	59.3	45.7	27.5	33.0	50.9

[1] Record incomplete. [2] No record.

Monthly and annual mean temperatures (in degrees Fahrenheit) at stations on the Central Pacific and Southern Pacific Railroads, etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	°	°	°	°	°	°	°	°	°	°	°	°	°
King City, Cal	....	....	....	....	....	....	....	....	....	[2]62.0	53.8	52.7	....
Kingsburgh, Cal	46.9	53.5	52.3	59.9	69.8	80.5	83.6	83.5	73.2	56.4	46.2	45.9	62.6
Knights' Landing, Cal	54.6	56.2	57.0	62.4	69.0	76.4	81.7	79.9	71.2	60.9	53.8	56.3	65.0
Lathrop, Cal	47.3	54.3	53.3	57.1	64.5	72.1	74.6	75.4	68.2	57.3	47.7	48.9	60.1
Lemoore, Cal	48.8	54.8	51.7	61.2	71.3	79.2	80.2	82.1	70.5	57.7	45.6	49.8	62.7
Livermore, Cal	45.7	54.4	51.0	54.8	60.8	68.1	70.1	72.4	68.5	61.6	53.3	57.4	59.8
Livingston, Cal	49.6	53.9	54.5	60.9	73.8	83.9	89.6	91.4	81.9	([1])	([1])	([1])	....
Lordsburgh, N. Mex	37.7	44.2	53.1	54.4	74.4	81.1	77.8	71.5	76.5	67.9	53.4	44.1	61.3
Los Angeles, Cal	57.6	62.7	58.1	60.2	67.1	69.3	75.7	76.3	69.1	64.1	61.1	56.8	64.8
Mammoth Tank, Cal	56.7	66.7	66.3	75.9	90.8	95.7	102.9	102.3	96.7	77.2	62.3	60.8	79.5
Maricopa, Ariz	53.4	62.4	63.0	70.1	86.8	93.2	98.9	94.2	88.3	70.7	56.4	53.7	74.3
Martinez, Cal	46.9	52.7	49.6	54.7	62.6	68.9	68.2	68.6	62.6	51.9	49.2	48.7	57.0
Marysville, Cal	47.6	54.7	52.9	56.0	([1])	80.2	76.0	76.6	79.0	66.0	61.9	50.8	....
Menlo Park, Cal	47.8	52.3	50.1	54.9	61.7	65.5	66.5	65.4	61.1	55.5	48.7	50.5	56.7
Merced, Cal	48.5	56.6	53.5	62.1	70.2	78.7	81.8	82.0	74.9	61.8	54.2	54.6	64.9
Modesto, Cal	47.9	54.0	54.4	61.1	73.6	83.2	86.9	87.3	74.3	61.1	49.8	50.1	65.3
Mojave, Cal	45.2	54.0	50.9	([1])	69.7	79.3	84.6	74.6	75.7	59.2	47.1	48.9	....
Monterey (Hotel), Cal	52.1	54.7	52.1	56.1	59.9	59.9	60.8	60.1	58.9	54.5	50.9	51.7	56.0
Monterey (R. R. Sta.), Cal	52.6	53.7	52.3	56.7	60.2	59.7	60.2	60.3	59.1	54.8	50.8	52.0	56.0
Napa, Cal	47.2	51.7	49.2	56.0	65.9	68.4	([1])	67.1	58.7	55.1	49.6	50.1	....
Newhall, Cal	50.8	54.0	51.0	56.8	66.7	78.5	85.7	85.9	70.6	59.4	50.5	53.2	63.6
Niles	47.8	53.3	50.4	56.5	62.9	66.6	71.5	71.4	65.5	56.2	50.2	48.6	58.4
Oakland, Cal	50.3	55.0	52.4	55.7	60.1	61.3	62.5	62.1	61.5	56.7	53.6	53.4	57.0
Ogden, Utah	28.8	38.9	38.2	52.8	67.8	75.4	84.3	79.8	63.9	51.2	33.6	37.2	54.3
Orland, Cal	49.6	57.1	56.9	61.3	70.0	83.0	86.9	85.9	79.3	62.6	54.4	53.5	66.7
Otego, Cal	21.5	32.1	27.2	39.1	54.6	65.5	71.5	70.6	53.3	38.5	23.0	28.1	43.8
Pajaro, Cal	52.1	55.8	51.0	55.9	59.9	61.4	63.5	64.2	63.4	57.1	55.5	56.3	58.0
Palisade, Nev	30.3	35.7	39.3	49.6	65.7	74.6	79.5	75.1	67.3	42.0	28.1	30.6	51.5
Pantano, Ariz	53.1	54.9	56.1	65.2	84.7	92.0	89.9	84.8	83.2	72.2	67.6	([1])	....
Petaluma, Cal	49.6	55.5	51.0	56.9	61.7	62.0	67.0	68.2	64.9	60.5	54.2	53.8	58.8
Pleasanton, Cal	51.0	55.7	52.4	57.7	63.6	69.7	73.7	76.1	70.8	60.5	53.3	([1])	....
Promontory, Utah	24.3	34.3	34.8	53.2	66.5	75.7	83.8	80.6	63.7	49.1	29.0	31.8	52.2
Ravenna, Cal	49.1	54.9	48.3	54.9	65.7	([1])	([1])	([1])	([1])	([1])	([1])	([1])	....
Red Bluff, Cal	46.3	55.6	53.8	57.7	67.2	81.6	85.0	84.5	78.0	63.3	53.7	52.5	64.9
Redding, Cal	46.4	([1])	55.3	65.5	71.3	82.4	84.6	85.7	79.5	63.7	50.3	48.7	....
Reno, Nev	32.8	41.6	42.4	48.9	60.3	66.6	72.2	73.1	68.4	49.5	36.1	37.3	52.4
Rocklin, Cal	51.7	54.4	52.6	58.9	67.1	77.4	79.6	76.8	69.7	59.6	51.8	50.5	62.5
Sacramento, Cal	46.3	53.7	53.1	58.4	66.7	75.3	75.7	72.0	66.4	56.2	48.3	48.9	60.1
Salinas, Cal	47.0	52.0	49.8	55.2	61.8	58.4	62.7	66.1	63.5	56.5	49.2	51.8	56.2
San Ardo, Cal	....	....	....	....	....	....	....	....	([2])	61.6	51.5	50.5	....
San Fernando, Cal	51.4	60.5	([1])	59.7	71.8	76.5	84.3	83.8	77.6	67.3	64.4	([1])	....
San Gorgonio, Cal	48.1	56.2	49.9	54.3	69.2	72.3	69.1	79.1	71.6	58.9	52.8	([1])	....
San José, Cal	49.1	53.3	51.0	54.7	60.5	63.9	66.3	66.7	63.7	57.3	52.3	52.4	57.6
San Mateo, Cal	50.3	54.7	53.8	57.8	64.0	66.6	68.4	67.5	65.1	59.2	54.0	54.1	59.6
San Miguel, Cal	....	....	....	....	....	....	....	....	....	[3]56.6	46.8	46.9	....
San Simon, Ariz	42.2	49.6	60.4	67.8	74.1	84.3	85.5	84.6	83.2	71.0	53.8	50.1	67.2
Santa Cruz, Cal	53.6	57.8	53.7	57.8	62.4	66.4	66.6	65.0	59.7	56.7	55.7	54.9	59.2
Santo Monica, Cal	54.6	)	59.2	57.0	63.1	66.7	66.7	69.3	66.5	61.4	58.5	52.4	....
Selma, Cal	46.4	54.0	54.3	61.7	73.5	83.7	85.9	83.3	75.2	62.6	49.5	47.8	64.8
Soledad, Cal	47.9	52.9	50.7	56.5	62.8	66.6	66.7	68.5	67.2	56.5	50.1	51.9	58.2
Soquel, Cal	51.4	61.1	53.9	55.7	60.9	60.3	62.6	61.3	61.3	51.2	51.4	59.0	57.5
South Side, Cal	....	....	....	....	....	[3]72.6	76.1	78.6	75.0	58.5	52.2	53.4	....
South Vallejo, Cal	51.7	51.4	55.0	59.2	65.3	71.8	72.4	71.7	69.3	61.3	55.6	54.6	61.6
Spadra, Cal	58.1	65.0	59.5	63.3	69.3	68.7	70.9	71.9	66.5	53.2	54.8	56.7	63.2
Stockton, Cal	48.1	54.1	53.1	57.4	63.8	72.0	74.6	73.1	68.2	59.0	51.0	50.9	60.4
Suisun, Cal	49.9	56.4	55.4	58.5	64.5	70.4	72.7	72.4	69.7	61.3	52.5	53.4	61.5
Summit, Cal	27.3	33.4	28.0	33.6	42.9	53.5	58.9	59.8	54.7	39.8	31.2	34.9	41.5
Sumner, Cal	47.5	52.9	56.6	60.3	68.5	84.4	88.2	83.8	72.8	56.5	46.7	49.5	64.0
Tecoma, Nev	27.1	40.5	38.1	51.8	65.4	70.3	81.3	80.2	61.5	44.5	25.0	31.0	51.4
Tehama, Cal	45.7	55.8	52.5	56.0	66.5	78.0	81.0	80.5	74.1	58.7	50.7	49.1	62.4
Tehachapi, Cal	39.7	44.3	41.2	46.1	60.6	74.2	79.9	77.7	66.9	50.7	42.4	44.3	55.7
Terrace, Utah	26.5	40.7	37.4	49.6	64.2	70.8	83.9	82.8	71.8	53.7	34.2	35.9	54.3
Texas Hill, Ariz	53.5	60.8	61.7	70.2	87.2	93.2	97.3	96.5	87.5	69.9	57.3	56.5	74.3
Toano, Nev	22.7	36.5	30.9	45.9	60.2	65.7	76.8	77.6	61.9	42.9	26.7	34.5	48.5
Towles, Cal	41.7	52.7	45.2	49.8	56.4	65.1	71.7	69.8	67.1	54.1	49.7	51.9	56.3
Tracy, Cal	48.0	55.7	55.1	60.9	69.2	80.4	84.1	81.4	73.5	63.8	53.2	52.1	64.8
Traver, Cal	47.9	54.1	52.3	59.2	70.5	78.9	81.4	81.5	72.9	56.8	47.8	([1])	....
Truckee, Cal	25.6	32.7	29.7	38.4	51.5	58.3	64.9	61.8	52.3	39.1	32.0	35.9	43.5
Tucson, Ariz	41.1	54.3	51.2	61.4	80.5	87.3	88.7	93.5	84.4	72.1	58.8	58.8	69.3
Tulare, Cal	49.9	57.3	55.1	60.7	66.9	76.6	83.7	87.3	78.1	64.8	49.5	50.7	65.0
Turlock, Cal	54.6	57.4	56.4	63.7	71.3	74.9	81.6	82.6	74.1	61.2	55.4	55.4	65.7
Wadsworth, Nev	32.1	43.7	43.5	55.7	69.2	74.6	81.5	80.9	70.7	50.8	35.6	42.4	56.7

[1] No. record. [2] Record incomplete. [3] No prior record.

Monthly and annual mean temperatures (in degrees Fahrenheit) at stations on the Central Pacific and Southern Pacific Railroads, etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Wells, Nev	26.0	38.6	37.0	43.0	57.6	72.1	79.4	74.9	59.7	41.4	28.8	33.1	49.3
Willcox, Ariz	44.1	48.9	51.6	60.6	76.4	83.3	85.5	79.8	74.1	64.3	55.4	53.2	64.8
Williams, Cal	46.8	52.5	54.7	61.0	70.5	83.8	85.8	82.7	75.7	66.6	49.5	52.6	65.2
Willows, Cal	44.1	53.1	52.3	55.6	67.5	81.1	82.7	83.1	80.0	64.2	52.9	51.0	64.0
Winnemucca, Nev	31.9	38.8	40.4	48.4	60.8	73.6	82.3	82.7	68.9	49.5	34.4	36.4	54.0
Woodland, Cal	48.1	55.3	57.1	61.5	70.8	78.4	80.2	78.6	71.7	55.5	53.3	51.1	63.5
Yuma, Ariz	56.9	65.6	61.4	70.1	84.6	88.4	95.6	93.5	86.8	77.1	64.7	60.7	75.4

APPENDIX No. 44.

Monthly maximum and minimum temperatures and annual range of temperature (in de- connecting branches, for the

[From self-register-

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°
Anaheim, Cal	74	34	72	42	74	42	74	48	84	56	89	60
Antioch, Cal	69	32	65	42	70	40	80	42	90	50	96	60
Aptos, Cal	70	27	73	38	70	35	75	40	79	48	80	50
Athlone, Cal	6[illegible]	38	74	28	74	40	59	50	105	52	102	57
Auburn, Cal	63	25	72	35	72	28	78	40	89	46	95	60
Battle Mountain, Nev.	56	4	64	20	70	28	76	30	92	38	92	38
Benson, Ariz	69	16	75	27	84	30	85	45	101	62	100	68
Beowawe, Nev	55	6	65	20	68	18	70	33	95	43	96	45
Bishop Creek, Cal	70	8	72	25	73	28	88	44	101	55	102	64
Blue Creek, Utah	49	2	48	22	54	26	66	38	91	43	107	46
Boca, Cal	60	—4	68	5	70	10	75	25	80	32	90	40
Borden, Cal	71	30	72	38	80	38	82	43	102	57	106	65
Brentwood, Cal	68	30	76	40	74	36	82	46	94	50	106	68
Brighton, Cal	70	30	82	42	74	40	80	48	95	55	101	62
Browns, Nev	68	8	62	26	70	30	76	39	94	46	97	47
Byron, Cal	66	24	76	36	76	36	84	48	96	56	102	70
Caliente, Cal	66	25	64	35	64	36	86	40	98	50	102	68
Calistoga, Cal	63	23	96	32	79	32	85	35	95	45	99	51
Carlin, Nev	58	0	62	20	70	20	74	32	90	36	98	38
Casa Grande, Ariz	76	28	80	38	85	48	90	54	108	69	110	78
Chico, Cal	66	29	80	40	76	38	89	44	100	50	106	66
Chualar, Cal	59	28	78	38	68	38	93	50	80	53	85	55
Cisco, Cal	41	12	48	20	52	15	50	25	73	30	78	42
Colfax, Cal	66	27	74	36	72	30	78	38	95	43	98	55
Colton, Cal	72	36	84	40	84	39	95	47	102	54	102	60
Corinne, Utah	52	0	56	20	66	25	74	34	97	28	97	45
Corning, Cal	61	28	73	37	72	38	83	38	92	50	97	70
Davisville, Cal	73	26	78	42	74	40	90	48	98	53	102	60
Delano, Cal	70	27	76	42	77	32	88	38	105	58	105	72
Delta, Cal	60	22	74	30	72	28	84	32	90	40	102	58
Deming, N. Mex	82	10	82	24	82	32	90	40	110	54	108	70
Dunnigan, Cal	62	29	68	33	70	39	86	45	96	54	102	70
Elko, Nev	50	0	62	20	70	12	70	28	98	42	98	44
Elmira, Cal	68	30	81	38	76	38	85	45	102	53	104	60
El Paso, Tex	76	15	74	28	78	34	78	34	101	50	102	70
Emigrant Gap, Cal	51	20	61	24	60	22	66	28	84	33	82	47
Farmington, Cal	67	27	76	41	77	33	83	51	95	53	104	61
Fresno City, Cal	65	29	70	42	78	38	84	46	100	48	106	59
Galt, Cal	62	28	68	38	69	38	80	44	93	57	102	63
Gilroy, Cal	65	22	82	33	79	35	75	43	96	49	99	53
Golconda, Nev	73	2	85	20	83	26	83	36	98	45	104	48
Goshen, Cal	68	27	76	39	72	32	88	45	103	58	103	60
Halleck, Nev	52	—10	62	12	64	10	76	26	98	28	102	34
Hawthorne, Nev	62	16	60	30	70	26	72	30	92	38	96	41
Holliston, Cal	66	30	76	37	76	34	78	41	90	50	92	52
Hot Springs, Nev	66	4	66	18	62	10	76	30	92	38	99	46
Humboldt, Nev	66	7	([1])	([1])	69	26	73	32	83	40	95	40
Indio, Cal	90	28	([1])	([1])	88	40	94	55	108	68	116	72
Ione, Cal	65	24	70	34	64	32	80	40	101	50	100	60
Keeler, Cal	65	30	72	25	70	31	79	44	([1])	([1])	97	60
Keene, Cal	66	28	78	39	75	35	82	40	99	50	101	62
Kelton, Utah	60	4	60	22	66	20	70	32	95	38	95	38
King City, Cal	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kingsburgh, Cal	62	29	70	38	80	32	86	42	100	52	108	66
Knight's Landing, Cal	70	34	74	40	80	40	84	46	94	52	100	58
Lathrop, Cal	63	30	67	38	75	38	76	45	90	51	102	57
Lemoore, Cal	65	28	72	38	74	32	84	42	102	50	110	60
Livermore, Cal	67	26	87	38	72	32	74	40	90	38	100	55
Livingston, Cal	63	28	67	41	67	40	87	45	103	59	110	64
Lordsburg, N. Mex	59	13	69	16	85	30	36	34	99	56	105	59

[1] No record.

APPENDIX No. 44.

grees Fahrenheit) at stations on the Central Pacific and Southern Pacific railroads and year ending December 31, 1886.

ing thermometers.]

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
98	58	94	63	88	57	97	46	86	39	82	40	64
104	58	100	54	94	46	85	44	70	34	66	38	72
80	50	82	50	90	45	78	35	73	32	74	38	63
113	61	107	61	98	57	85	50	86	40	70	40	85
101	58	101	58	96	53	81	32	69	30	64	31	76
102	46	104	54	92	32	78	24	56	6	60	6	100
102	72	98	70	93	60	84	40	77	28	72	26	86
101	60	100	60	90	40	75	25	59	8	60	8	95
106	70	102	67	100	60	80	38	71	29	72	26	98
112	48	102	60	90	52	69	32	48	14	47	25	110
95	38	90	40	82	28	78	14	60	4	60	10	99
107	65	108	67	103	58	88	45	70	29	69	32	78
111	64	103	60	94	52	82	50	65	36	([1])	([1])	....
112	63	108	62	102	58	92	44	80	34	74	32	82
103	57	98	55	91	42	77	32	55	12	59	22	95
112	64	107	60	102	58	88	44	78	28	70	30	88
104	60	102	64	98	54	84	49	70	38	74	36	79
105	55	103	51	104	48	91	33	75	27	70	27	82
102	52	100	52	90	32	82	24	66	2	56	9	102
111	81	110	79	106	70	91	49	80	35	86	36	83
114	68	109	69	105	55	90	37	84	33	76	33	85
90	55	85	55	100	50	85	43	85	33	75	32	72
84	40	80	43	77	38	65	20	50	12	48	18	72
104	58	100	58	99	50	82	38	72	31	67	35	77
111	68	111	70	105	58	94	42	88	38	92	40	75
103	62	100	60	83	41	76	32	52	8	50	12	103
100	69	99	65	100	60	86	45	66	31	70	33	72
111	55	112	54	104	50	89	41	82	29	75	32	86
110	72	109	71	102	59	85	48	75	30	70	33	83
108	50	105	56	105	48	80	28	78	21	70	28	87
114	72	106	74	100	56	88	44	90	22	86	24	104
110	64	104	62	104	55	92	44	70	30	70	34	81
112	52	102	55	91	35	70	25	72	1	60	6	112
109	61	107	71	103	61	92	45	83	31	81	31	79
112	70	98	69	97	50	90	47	72	19	73	23	97
88	44	86	48	88	46	69	28	75	21	70	26	68
112	60	108	60	102	54	91	41	73	33	67	34	85
109	58	107	60	100	50	84	40	80	35	64	38	80
105	63	102	60	99	50	86	41	73	32	67	30	77
102	55	102	55	100	49	88	36	76	25	75	29	80
108	59	103	63	102	44	85	32	78	9	70	15	106
110	67	110	65	104	55	87	38	72	25	68	28	85
104	50	102	49	92	19	80	10	62	−12	64	−2	116
104	61	100	68	90	46	70	30	60	20	68	26	88
100	57	100	57	103	50	90	42	75	32	70	34	73
106	54	99	58	94	38	80	27	60	8	64	9	102
99	50	90	50	82	45	75	30	65	8	62	20	....
121	74	120	70	120	68	98	55	98	33	92	40	....
106	60	105	56	100	48	90	38	72	24	64	28	82
99	70	100	73	86	60	77	40	64	25	62	32	....
105	60	103	62	96	57	85	35	75	32	74	30	77
103	60	96	58	83	32	78	28	58	5	55	6	99
....	....	....	....	....	([2])	97	38	81	26	81	30	....
110	64	108	63	102	52	90	36	68	24	68	30	86
110	58	108	62	96	54	90	40	80	30	78	32	80
104	59	101	59	101	50	90	32	72	27	67	28	77
106	55	106	55	104	50	90	32	65	28	70	27	83
104	50	100	55	102	50	82	42	80	30	([1])	30	78
114	70	115	71	110	60	94	([1])	([1])	([1])	89	28	....
102	62	92	59	96	60	84	40	76	20	70	23	92

[1] No prior record.

Monthly maximum and minimum temperatures and annual range of temperature (in degrees

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°
Los Angeles, Cal	75	44	80	49	70	46	79	50	88	57	89	60
Mammoth Tank, Cal	90	37	89	50	99	48	101	50	120	64	124	72
Maricopa, Ariz	70	25	80	35	80	40	85	50	110	60	110	70
Martinez, Cal	68	28	68	38	70	36	68	40	83	51	88	54
Marysville, Cal	62	32	68	43	75	40	77	43	([1])	([1])	104	56
Menlo Park, Cal	68	28	70	37	74	34	78	37	90	46	88	50
Merced, Cal	66	30	80	40	78	34	84	42	100	46	105	60
Modesto, Cal	64	29	76	40	76	40	80	43	96	53	104	69
Mojave, Cal	72	19	86	30	86	31	([1])	([1])	94	44	99	63
Monterey (Hotel), Cal	70	30	75	39	72	33	70	42	72	50	78	51
Monterey (R. R. sta.), Cal	69	29	75	35	73	33	70	45	72	54	74	53
Napa, Cal	67	24	69	32	75	33	74	35	96	50	95	50
Newhall, Cal	80	26	83	34	79	30	79	43	94	35	104	37
Niles, Cal	62	30	76	40	74	38	82	40	90	43	99	50
Oakland Cal	62	34	66	42	68	40	68	42	76	48	74	54
Ogden, Utah	52	—5	63	20	70	21	80	30	106	30	104	42
Orland, Cal	66	33	76	40	80	42	85	44	96	52	102	62
Otego, Cal	42	—8	52	14	60	8	67	22	84	27	88	50
Pajaro, Cal	70	30	80	40	68	32	75	34	74	45	75	53
Palisade, Nev	60	6	60	22	58	20	70	34	94	38	100	48
Pantano, Ariz	82	32	87	40	92	38	98	40	104	67	110	80
Petaluma, Cal	66	30	76	38	76	36	80	42	90	48	94	42
Pleasanton, Cal	72	27	83	34	78	33	83	44	94	45	102	50
Promontory, Utah	48	0	50	20	50	22	66	38	88	40	92	56
Ravenna, Cal	76	26	78	34	80	28	80	30	98	42	([1])	([1])
Red Bluff, Cal	68	28	80	40	80	36	99	36	94	44	104	60
Redding, Cal	70	33	81	38	78	33	92	43	94	50	102	65
Reno, Nev	50	15	70	26	68	26	72	30	86	38	92	44
Rocklin, Cal	68	30	70	40	74	40	82	40	91	48	98	52
Sacramento, Cal	65	32	69	42	70	40	76	45	83	53	92	61
Salinas, Cal	65	30	64	44	62	38	68	44	82	52	72	46
San Ardo, Cal	......	......	......	......	......	......	......	......	......	......	......	......
San Fernando, Cal	78	38	92	40	......	......	76	40	96	53	98	59
San Gorgonio, Cal	70	32	79	40	70	33	73	38	99	49	98	50
San José, Cal	64	32	72	40	74	37	75	40	83	48	93	50
San Mateo, Cal	66	34	68	44	72	40	76	48	84	54	86	55
San Miguel, Cal	......	......	......	......	......	......	......	......	......	......	......	......
San Simon, Ariz	74	14	70	29	75	46	86	56	93	60	102	74
Santa Cruz, Cal	68	32	77	42	72	35	78	38	85	48	83	50
Santa Monica, Cal	68	40	([1])	([1])	68	43	67	48	76	50	80	55
Selma, Cal	66	27	74	40	76	38	86	45	101	59	106	68
Soledad, Cal	68	22	76	32	74	32	80	36	84	36	100	54
Soquel, Cal	74	28	72	40	78	40	72	42	76	50	84	50
South Side, Cal	......	......	......	......	......	......	......	......	......	([3])	98	52
South Vallejo, Cal	70	38	65	45	75	42	77	48	85	55	87	59
Spadra, Cal	82	30	87	44	90	38	84	46	100	55	100	52
Stockton, Cal	60	30	66	42	72	38	76	46	90	50	98	58
Suisun, Cal	68	31	76	42	82	40	85	43	94	51	99	55
Summit, Cal	40	5	44	15	44	11	48	18	62	27	73	38
Sumner, Cal	72	28	78	32	80	40	86	40	103	40	108	65
Tecoma, Nev	55	0	70	18	65	20	70	28	90	40	92	44
Tehama, Cal	64	30	74	36	74	38	86	40	94	42	103	60
Tehachapi, Cal	64	22	64	22	66	24	68	30	86	38	96	58
Terrace, Utah	46	4	64	18	66	22	68	32	92	40	92	34
Texas Hill, Ariz	78	26	82	43	89	43	93	55	112	70	115	75
Toano, Nev	44	—8	56	22	58	16	64	25	90	22	93	35
Towles, Cal	70	28	74	30	72	30	78	36	88	40	90	50
Tracy, Cal	66	28	78	40	74	30	80	46	96	50	104	60
Traver, Cal	66	28	70	38	76	31	85	42	101	53	106	61
Truckee, Cal	46	4	52	16	54	4	74	22	80	30	86	42
Tucson, Ariz	55	22	78	41	71	38	93	44	104	55	105	77
Tulare, Cal	68	30	73	44	78	33	89	40	107	43	108	58
Turlock, Cal	82	27	89	38	86	35	94	45	100	48	106	47
Wadsworth, Nev	62	8	64	20	70	28	76	36	96	46	99	52
Wells, Nev	50	—5	58	24	69	15	66	24	95	35	92	42
Willcox, Ariz	70	14	79	25	82	32	84	41	100	55	103	69
Williams, Cal	65	28	68	40	70	40	85	47	96	50	103	70
Willows, Cal	65	32	70	42	72	42	82	42	98	48	100	68
Winnemucca, Nev	60	4	64	20	69	23	68	28	87	40	100	44
Woodland, Cal	65	32	72	44	74	40	81	40	97	54	99	64
Yuma, Ariz	79	38	80	52	75	45	85	56	101	70	99	75

[1] No record.

Fahrenheit) at stations on the Central Pacific and Southern Pacific railroads, etc.—Cont'd.

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
98	62	96	64	90	59	80	54	82	50	85	40	58
128	84	126	80	120	80	99	59	88	42	82	40	91
115	80	115	70	105	65	90	55	80	35	70	30	90
91	54	90	50	90	42	72	40	64	32	62	34	63
100	60	98	60	95	60	83	54	89	34	68	34	....
94	52	93	50	97	42	80	38	68	31	70	32	71
107	58	108	54	100	52	92	38	83	30	76	34	78
112	70	115	62	100	53	94	43	72	36	68	30	86
100	66	103	70	96	59	79	42	72	24	68	29	....
76	55	79	54	79	47	72	38	71	32	70	36	49
75	53	79	54	79	51	73	38	72	33	68	36	50
(1)	(1)	100	42	84	45	84	32	75	27	66	28	....
110	63	112	66	106	50	88	41	88	25	84	28	87
98	57	95	60	98	49	77	42	70	37	67	37	69
78	52	76	56	80	50	66	44	66	40	64	42	44
107	58	107	59	94	37	78	29	56	19	58	18	112
106	66	105	64	103	58	90	40	80	34	78	34	73
102	38	92	50	82	30	66	20	47	4	48	10	110
83	57	81	56	98	45	81	33	84	28	78	33	70
106	58	101	60	88	36	78	28	54	—1	50	6	107
110	64	110	64	106	67	96	54	90	47	(1)	(1)	....
94	47	92	53	98	50	84	44	74	36	72	38	68
103	57	100	58	99	51	88	38	78	31	(1)	(1)	....
110	64	112	64	88	40	86	27	70	0	48	16	112
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	....
111	62	110	60	111	56	99	44	82	32	75	40	83
108	70	105	68	104	63	85	42	78	30	68	32	78
100	50	96	58	90	48	70	30	60	10	56	18	90
106	55	100	58	96	50	82	43	68	32	66	38	76
98	59	90	59	85	50	79	42	64	34	60	34	66
72	56	82	57	96	55	72	38	70	32	70	32	66
....	....	....	....	(2)	(2)	90	40	81	30	68	32	....
105	63	106	61	100	51	93	50	89	48	(1)	(1)	....
99	49	108	60	102	50	82	40	75	82	(1)	(1)	....
96	54	94	53	94	48	83	41	70	35	65	34	64
87	57	90	56	93	50	78	45	73	39	67	40	59
....	....	....	....	....	(3)	85	38	75	20	73	24	....
108	70	111	70	(1)	(1)	95	40	90	19	85	14	....
87	51	87	51	98	44	80	39	76	39	75	37	66
80	58	88	60	74	60	70	58	75	43	71	38	....
110	67	110	63	102	55	91	36	74	30	71	33	83
90	54	96	54	98	50	82	34	80	26	78	28	78
88	46	86	48	94	50	70	40	72	36	76	42	66
104	56	106	60	110	50	92	37	89	30	78	30	....
90	62	87	58	91	55	79	45	77	42	68	41	53
103	49	103	49	102	40	79	39	84	31	90	32	73
102	58	100	58	94	52	82	42	68	36	62	36	72
105	57	100	58	104	53	92	43	74	36	70	37	74
78	33	77	43	74	35	61	24	52	13	48	22	73
111	62	110	60	102	50	78	40	68	32	70	30	83
90	64	96	64	90	34	76	22	52	4	49	12	96
108	64	106	64	102	60	90	38	73	33	64	38	78
98	60	96	60	86	42	76	32	70	22	72	20	78
106	68	102	62	92	48	75	30	50	20	50	24	102
117	83	120	80	112	72	105	53	83	29	83	35	94
100	48	100	54	86	28	66	20	46	6	56	12	108
99	50	96	50	90	50	80	34	76	28	80	30	71
112	64	104	66	100	54	88	48	74	30	70	34	84
109	62	109	60	103	54	90	36	70	28	(1)	(1)	....
91	40	88	42	86	32	62	20	54	10	52	10	87
104	80	110	78	100	64	86	56	82	45	74	49	88
114	63	103	68	101	59	89	40	74	27	69	29	87
116	52	108	65	104	52	91	38	80	30	82	32	89
104	60	100	64	96	46	74	26	58	12	66	22	96
102	59	90	58	82	35	60	26	50	8	61	8	107
103	72	95	70	85	67	75	48	69	41	69	34	89
111	68	105	62	103	58	91	45	70	33	70	34	83
109	66	107	64	103	62	95	50	78	35	72	33	77
107	53	102	58	98	30	89	20	70	4	62	16	103
100	66	95	65	93	54	80	40	85	34	68	34	68
108	85	102	83	94	77	90	56	79	44	75	50	70

[1] Record incomplete.

[2] No prior record.

APPENDIX No. 45.

Monthly and annual precipitation (in inches and hundredths) at stations on the Central Pacific and Southern Pacific railroads and connecting branches, for the year ending December 31, 1886 (*copied from the records on file at the office of the chief engineer, Central Pacific Railroad*), *also average monthly and seasonal precipitation in California, Oregon, Washington Territory, Nevada, Utah, Arizona, and New Mexico.*

Original stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Anaheim, Cal	4.63	0.82	2.70	2.51	0.00	0.00	0.00	T	0.00	0.00	0.33	0.00	10.99
Antioch, Cal	3.60	0.00	0.56	2.03	T	0.00	0.00	0.00	0.00	0.40	T	1.02	7.61
Aptos, Cal	7.61	0.80	4.09	7.10	0.27	0.00	0.00	0.00	0.00	0.70	0.84	1.53	22.94
Athlone, Cal	2.87	0.11	2.78	(1)	0.00	0.10	0.00	0.00	0.00	0.32	0.92	0.69	......
Auburn, Cal	8.25	0.00	4.20	9.38	0.65	0.00	0.00	0.00	0.00	0.89	1.26	4.88	29.51
Battle Mountain, Nev	1.29	0.10	0.66	1.72	0.24	0.21	0.38	0.00	0.18	1.10	1.50	0.44	7.82
Benson, Ariz	0.79	0.67	0.08	0.00	0.00	0.00	1.44	2.68	0.17	0.25	0.00	0.19	6.27
Beowawe, Nev	0.78	0.08	0.35	0.41	0.22	0.00	0.25	0.00	0.00	1.19	0.80	0.68	4.76
Bishop Creek, Cal	0.13	0.01	(1)	0.38	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.20	......
Blue Creek, Utah	1.16	0.35	1.05	0.80	0.05	0.70	0.88	0.55	0.91	0.85	1.05	0.28	8.63
Boca, Cal	8.35	0.85	4.40	1.30	0.50	0.00	1.00	0.00	0.10	0.70	0.70	0.70	18.60
Borden, Cal	3.98	0.08	1.66	2.93	0.00	0.00	0.00	0.00	0.00	0.38	0.65	0.57	10.25
Brentwood, Cal	4.16	0.03	1.51	2.08	0.00	0.00	0.00	0.00	0.00	0.15	T	(1)	[illegible]
Brighton, Cal	5.49	0.07	3.05	4.16	0.10	0.00	0.00	0.00	0.00	0.85	0.12	1.47	15.81
Browns, Nev	0.40	0.00	0.32	T	0.00	0.00	0.00	0.00	0.00	0.62	0.10	0.35	1.79
Byron, Cal	4.09	0.00	1.79	2.23	0.00	0.00	0.00	0.00	0.00	0.89	0.00	0.95	9.95
Caliente, Cal	1.59	0.66	2.62	2.65	0.00	0.00	T	0.00	0.00	T	1.45	(1)	......
Calistoga, Cal	9.39	T	2.23	7.12	1.05	0.00	0.00	0.00	0.00	1.25	0.00	3.95	24.99
Carlin, Nev	2.13	0.42	1.31	0.32	0.28	0.24	0.08	0.00	0.00	0.59	0.85	0.85	7.07
Casa Grande, Ariz	0.90	(1)	0.74	0.09	0.00	0.00	0.33	1.40	0.00	0.00	0.35	0.00	......
Chico, Cal	4.44	0.75	2.29	4.17	0.36	0.00	0.00	0.00	0.00	0.97	0.15	(1)	......
Chualar, Cal	2.80	1.10	1.50	2.20	0.07	0.00	0.00	0.00	0.00	0.15	0.70	0.40	8.92
Cisco, Cal	14.55	2.40	7.40	7.50	1.45	0.00	0.00	0.00	0.00	1.45	1.00	6.10	41.85
Colfax, Cal	12.17	0.34	3.69	10.86	1.08	0.00	0.00	0.00	0.00	1.96	0.46	6.12	36.68
Colton, Cal	2.78	0.40	3.54	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.00	8.02
Corinne, Utah	1.00	1.50	2.25	0.75	0.00	0.60	0.65	0.15	1.75	0.00	1.40	0.25	10.30
Corning, Cal	5.68	0.00	1.41	3.45	0.58	0.00	0.00	0.00	0.00	0.30	0.00	2.01	13.43
Davisville, Cal	5.32	0.20	1.70	4.75	0.05	0.00	0.00	0.00	0.00	0.48	0.00	1.81	14.31
Delano, Cal	0.75	0.20	0.80	1.54	0.00	0.00	0.00	0.00	0.00	T	0.69	1.92	5.90
Delta, Cal	9.95	0.50	3.52	10.19	8.16	0.60	0.00	0.00	T	1.30	0.30	8.81	43.33
Deming, N. Mex	0.68	0.50	0.00	0.00	0.00	0.00	1.13	4.19	4.36	0.50	0.00	0.00	11.36
Dunnigan, Cal	8.37	T	1.69	3.61	0.18	0.00	0.00	0.00	0.00	0.51	T	1.91	16.27
Elko, Nev	2.23	0.43	1.39	0.53	0.24	0.46	0.00	0.00	0.00	0.20	0.60	(1)	......
Elmira, Cal	8.01	0.00	1.35	4.22	0.14	0.00	0.00	0.00	0.00	0.38	0.03	2.72	16.82
El Paso, Tex	0.40	0.09	T	0.00	0.00	1.06	1.01	1.36	2.10	(1)	1.30	(1)	......
Emigrant Gap, Cal	18.28	1.97	6.90	11.94	2.73	T	0.00	0.00	0.00	2.96	0.40	8.00	53.18
Farmington, Cal	4.60	0.41	1.87	5.01	0.19	0.00	0.00	0.00	0.00	0.27	0.89	1.37	14.61
Fresno City, Cal	2.38	0.58	1.21	2.57	0.00	0.00	0.00	0.00	0.09	0.47	0.70	0.34	8.25
Galt, Cal	6.04	0.00	1.69	3.58	0.15	0.00	0.00	0.00	0.00	0.48	0.85	1.76	14.55
Gilroy, Cal	6.09	0.32	1.17	4.32	0.22	0.00	0.00	0.00	0.03	0.78	0.33	1.09	14.32
Golconda, Nev	0.65	0.02	0.50	0.88	0.00	0.52	0.42	0.00	0.00	0.91	0.20	0.25	4.35
Goshen, Cal	1.74	0.43	1.06	1.67	0.00	0.00	0.00	0.00	0.00	0.10	0.55	0.69	6.24
Halleck, Nev	2.16	0.24	1.00	0.20	0.74	0.15	0.00	0.00	0.00	1.19	0.80	0.20	6.68
Hawthorne, Nev	0.0	0.00	0.85	0.40	0.00	0.00	T	0.00	0.00	0.00	0.00	(1)	......
Holliston, Cal	3.93	0.22	1.29	2.55	0.15	0.00	0.00	0.00	0.00	0.38	0.42	0.54	9.48
Hot Springs, Nev	0.95	0.52	0.30	0.35	T	0.16	0.00	0.00	0.00	0.46	0.50	(1)	......
Humboldt, Nev	0.85	(1)	0.40	0.35	0.00	(1)	T	0.00	0.00	0.10	0.60	0.24	......
Indio, Cal	0 0	(1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	......
Ione, Cal	5.15	0.07	2.40	6.06	0.84	0.00	0.00	0.00	0.00	1.20	0.70	1.64	18.06
Keeler, Cal	0.36	T	0.63	0.40	(1)	0.00	0.14	0.08	0.00	0.01	0.08	0.00	......
Keene, Cal	2.02	0.64	2.93	2.84	0.00	T	T	0.02	0.00	T	1.95	1.10	11.50
Kelton, Utah	1.13	0.38	0.20	0.38	0.08	1.42	0.22	0.44	0.35	0.57	1.25	0.32	6.74
King City, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	[3]0.14	0.36	0.03	......
Kingsburgh, Cal	2.04	0.24	1.03	2.45	0.00	0.00	0.00	0.00	0.00	0.20	0.58	0.43	6.97
Knight's Landing, Cal	5.53	0.00	1.37	4.25	0.00	0.00	0.00	0.00	0.00	0.23	0.00	1.60	12.98
Lathrop, Cal	2.93	0.01	1.08	2.46	0.00	0.00	0.00	0.00	0.00	0.21	0.83	0.40	7.92
Lemoore, Cal	3.16	0.20	1.21	3.35	0.00	0.00	T	0.00	0.00	0.25	0.30	0.15	8.62
Livermore, Cal	4.20	0.24	1.18	2.36	0.00	0.00	0.40	0.00	0.00	0.30	0.70	0.46	9.84
Livingston, Cal	3.06	0.03	1.83	2.80	0.00	0.00	0.00	0.00	0.00	(1)	(1)	0.81	......

[1] No record. [2] Record incomplete. [3] No prior rocord. T indicates trace of prcipitation.

***Monthly and annual precipitation (in inches and hundredths) at stations on the Central Pacific and Southern Pacific railroads, etc.*—Continued.**

Original stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Lordsburg, N. Mex	T	0.33	0.00	0.00	0.00	0.00	1.54	1.65	1.17	0.17	0.20	0.00	5.06
Los Angeles, Cal	6.71	T	3.22	0.70	0.00	0.00	0.00	0.00	0.00	0.00	(1)	0.26	.....
Mammoth Tank, Cal	0.57	0.20	0.25	0.05	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.24	1.33
Maricopa, Ariz	0.40	2.00	0.80	0.00	0.00	0.00	0.00	0.75	0.00	1.00	0.00	0.00	4.95
Martinez, Cal	5.39	0.05	1.53	3.44	0.25	0.00	0.07	0.00	0.00	0.93	0.58	1.29	13.53
Marysville, Cal	3.96	0.34	1.45	3.96	(1)	0.00	0.00	0.00	0.00	0.63	T	2.30	...
Menlo Park, Cal	4.97	0.37	1.65	3.34	0.08	0.00	0.24	0.00	0.00	0.86	0.40	1.26	13.17
Merced, Cal	2.64	0.10	0.94	2.85	0.00	0.00	0.00	0.00	0.00	(1)	0.25	0.58	.....
Modesto, Cal	2.54	0.10	1.46	2.79	0.00	0.00	0.00	0.00	0.00	0.25	1.01	0.65	8.80
Mojave, Cal	1.49	0.00	1.22	(1)	0.00	T	T	0.00	0.00	T	0.76	0.08	.....
Monterey (railroad station), Cal	3.09	1.14	2.52	3.39	0.08	0.00	0.00	0.00	0.00	0.70	0.78	0.60	12.30
Napa, Cal	8.09	0.00	1.81	4.42	0.38	0.00	(1)	0.00	0.00	1.16	0.11	2.58	.....
Newhall, Cal	5.22	0.69	3.11	4.27	0.00	T	0.00	0.00	0.00	0.00	0.87	0.21	14.37
Niles, Cal	6.17	0.63	1.72	4.18	0.18	0.00	0.00	0.00	0.00	0.57	1.27	1.15	15.87
Oakland, Cal	6.77	0.30	2.00	3.90	0.19	0.00	0.08	0.00	0.00	1.60	0.25	2.96	18.05
Ogden, Utah	2.10	0.88	1.82	1.57	0.00	0.30	0.00	0.42	1.23	1.97	1.72	0.59	12.60
Orland, Cal	4.45	0.50	1.01	2.70	0.64	0.10	0.00	0.00	0.00	0.50	(1)	1.77	.....
Otego, Cal	2.05	0.70	1.45	0.48	0.15	(1)	0.00	0.36	0.17	1.66	0.45	0.52	.....
Pajaro, Cal	6.05	0.47	3.20	5.25	0.04	0.00	0.00	0.00	0.00	0.85	0.60	1.24	17.70
Palisade, Nev	0.30	0.55	0.75	0.28	0.00	0.10	0.00	0.00	0.10	0.40	1.25	0.37	4.10
Pantano, Ariz	1.15	1.07	0.86	0.30	0.00	0.00	1.00	2.54	2.24	0.46	0.50	(1)	.....
Petaluma, Cal	6.09	0.00	2.30	4.47	0.54	0.00	0.00	0.00	0.02	0.69	0.57	1.21	15.89
Pleasanton, Cal	4.25	0.29	1.34	3.08	0.39	0.00	0.00	0.00	0.00	0.39	0.73	(1)	.....
Promontory, Utah	1.37	0.71	1.25	0.05	0.00	0.19	0.00	0.23	0.91	0.16	0.72	0.10	5.69
Ravenna, Cal	5.30	0.11	4.51	2.70	0.00	(1)		....	....	.....	...	.....	.....
Red Bluff, Cal	5.07	0.00	1.38	4.63	0.91	0.00	0.00	0.00	0.00	1.92	0.47	4.06	18.46
Redding, Cal	10.30	(1)	2.90	8.41	2.32	0.00	0.00	0.00	0.00	0.98	0.13	5.34	.....
Reno, Nev	3.00	0.20	0.70	0.00	0.10	0.00	0.15	0.00	0.00	0.02	0.00	0.30	4.47
Rocklin, Cal	5.81	0.34	3.61	4.61	0.10	0.00	0.00	0.00	0.00	1.01	0.97	2.43	18.94
Sacramento, Cal	5.00	0.10	2.53	3.33	0.05	0.00	0.00	0.00	0.00	0.56	0.11	1.82	13.50
Salinas, Cal	5.18	1.16	2.16	4.03	0.08	0.00	0.00	0.00	0.00	0.59	0.80	0.85	14.85
San Ardo, Cal	...	.....	...	...	....	.....	....	...		....	0.35	0.17	.....
San Fernando, Cal	6.70	(1)	(1)	3.39	0.00	0.00	0.19	T	0.00	0.78	0.87	(1)	.....
San Gorgonio, Cal	2.97	1.73	3.07	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.58	(1)	.....
San José, Cal	3.59	1.12	1.89	4.47	0.00	0.00	0.03	0.00	0.00	0.49	0.73	0.71	13.03
San Mateo, Cal	6.20	0.35	2.20	4.50	0.15	0.00	0.07	0.00	0.00	1.69	0.77	0.91	16.84
San Miguel, Cal	(2)..	....	...	...	.....	.....	...	.....	...	(2)0.00	0.24	0.21	.....
San Simon, Ariz	0.10	0.20	0.00	0.00	0.00	0.00	(1)	0.71	2.24	0.05	0.32	0.30	.....
Santa Cruz, Cal	7.60	0.80	3.05	7.60	0.30	0.00	0.00	0.00	0.00	0.79	1.10	2.20	23.44
Santa Monica, Cal	5.30	1.10	1.20	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.27	10.47
Selma, Cal	1.97	0.36	0.96	1.98	0.00	0.00	0.00	0.00	0.00	0.27	0.59	0.60	6.73
Soledad, Cal	2.44	0.93	1.69	1.93	0.00	0.00	0.02	0.00	0.00	0.32	0.70	0.15	8.18
South Side, Cal	....	....	....	....	.....	(2)0.00	0.17	0.00	0.00	0.00	1.00	0.23	.....
South Vallejo, Cal	6.25	0.00	2.20	4.82	0.22	0.00	0.00	0.00	0.00	0.47	0.83	1.77	16.56
Spadra, Cal	5.76	0.45	2.80	2.85	0.00	0.00	T	0.00	0.00	0.00	1.05	0.40	13.31
Stockton, Cal	4.36	0.05	1.60	3.25	0.00	0.00	0.00	0.00	0.00	0.28	0.75	0.69	10.98
Suisun, Cal	8.18	T	1.87	4.02	0.15	0.00	0.00	0.00	0.00	0.49	0.22	1.80	16.73
Summit, Cal	13.90	1.40	7.80	6.40	0.95	0.00	0.00	0.00	0.00	3.10	1.70	5.95	41.20
Sumner, Cal	0.85	0.20	0.35	0.94	0.00	0.35	0.00	0.00	0.00	0.00	0.60	0.45	3.74
Tecoma, Nev	1.00	0.70	0.80	0.00	0.00	0.40	0.50	0.40	0.10	0.19	0.22	0.32	4.63
Tehama, Cal	4.08	T	0.98	4.00	0.18	0.00	0.00	T	0.00	0.78	T	2.00	12.02
Tehachapi, Cal	1.28	0.00	4.10	4.57	0.00	0.00	0.10	0.00	0.00	T	1.15	0.60	11.80
Terrace, Utah	0.57	0.58	0.50	0.39	0.12	1.23	0.15	0.95	0.55	0.05	0.25	0.15	5.49
Texas Hill, Ariz	0.93	1.10	0.00	0.20	0.00	0.00	T	0.55	0.00	1.50	0.00	0.00	4.28
Toano, Nev	1.17	0.12	1.45	0.36	2.28	7.50	0.11	0.00	0.35	0.78	1.35	0.38	15.85
Towles, Cal	9.80	0.50	5.10	2.30	0.00	0.00	0.00	0.00	0.00	1.80	0.80	3.00	23.30
Tracy, Cal	2.55	0.35	1.40	1.55	0.00	0.00	0.00	0.00	0.00	0.40	0.10	0.50	6.85
Traver, Cal	1.90	0.47	1.06	2.01	0.00	0.00	0.00	0.00	0.00	0.10	0.57	(1)	.....
Truckee, Cal	7.08	0.50	2.90	1.78	0.60	0.56	0.89	0.00	T	0.85	1.10	2.29	18.57
Tucson, Ariz	0.92	0.15	0.50	0.00	0.00	0.60	0.00	4.94	0.44	0.42	0.45	0.06	7.82
Tulare, Cal	1.41	0.15	0.80	1.94	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.55	5.40
Turlock, Cal	2.52	0.08	1.75	3.01	0.00	0.00	0.00	0.00	0.00	0.29	0.50	0.55	8.70
Wadsworth, Nev	1.62	0.30	0.85	T	T	T	0.00	0.00	0.00	2.35	0.18	0.00	5.30
Wells, Nev	1.07	0.20	0.39	0.47	0.30	0.20	0.40	0.26	0.00	0.50	0.50	3.25	7.48
Willcox, Ariz	1.36	0.79	0.19	0.32	0.00	0.06	0.32	2.39	1.49	0.22	0.21	0.01	7.36
Williams, Cal	3.83	0.00	0.89	3.01	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.95	9.28
Willows, Cal	4.04	(1)	0.35	2.45	0.00	0.00	0.00	0.00	0.00	0.00	T	1.19	.....
Winnemucca, Nev	0.97	0.44	0.86	1.45	0.14	0.76	0.61	0.00	0.00	1.12	0.73	0.84	7.02
Woodland, Cal	4.78	0.00	1.31	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29	11.48
Yuma, Ariz	0.78	T	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09

[1] No record. [2] No prior record. T indicates trace of precipitation.

APPENDIX No. 45—Continued.

Average monthly and seasonal precipitation in California, Oregon, Washington Territory, Nevada, Utah, Arizona, and New Mexico.

Place and State.	Years of record.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Average for season.
Fort Terwaw, Cal	2 3/12	2.41	0.71	4.58	4.52	12.71	11.01	9.97	8.78	4.50	6.07	3.63	0.12	69.01
Berryvale, Cal	1 11/12	0.00	0.00	1.19	3.48	3.32	5.09	3.67	2.00	5.94	3.90	0.30	0.00	28.89
Scott Valley, Cal	27 4/12	0.49	0.20	0.50	1.24	3.15	4.96	4.84	2.93	2.57	1.84	0.98	0.46	24.16
Little Hot Springs, Cal	1 4/12	0.79	1.60	0.00	2.81	4.45	2.14	5.53	2.81	3.00	1.73	1.51	0.76	27.13
Fort Humboldt, Cal	6	0.25	0.03	0.44	1.51	3.00	9.41	5.51	4.64	5.61	2.37	0.93	0.20	33.90
Arcata, Cal	1 4/12	0.00	0.00	0.00	3.19	1.77	9.03	5.85	6.07	3.08	7.38	1.32	0.00	37.69
Reed's Camp, Cal	4 9/12	0.06	0.00	0.57	5.63	3.72	12.06	12.40	7.48	11.45	10.88	3.75	1.95	69.95
Fort Reading, Cal	3 11/12	T	0.06	0.16	0.69	3.20	5.78	4.88	3.27	3.91	3.92	2.85	0.31	29.03
Corning, Cal	8 11/12	0.00	0.06	0.26	1.04	1.24	2.06	3.50	2.47	2.16	1.99	0.46	0.00	15.18
Mumford Hill, Cal	5 8/12	0.14	0.32	0.69	2.23	4.10	11.12	13.08	12.33	10.71	7.56	2.96	0.57	65.81
Cherokee, Cal	12 4/12	0.11	0.06	0.46	2.95	5.40	6.60	8.44	7.54	7.95	3.37	1.47	0.60	44.95
Cherokee Reservation, Cal	6	0.30	0.23	0.54	4.08	7.80	5.77	13.35	9.95	11.69	3.78	2.06	0.72	60.27
Little Stony, Cal	1 4/12	0.00	0.00	0.00	0.27	13.29	3.51	2.50	1.04	0.55	2.63	0.00	0.58	24.37
Font's Spring, Cal	1 11/12	0.00	0.00	0.00	0.45	9.81	3.84	5.64	4.04	2.93	4.68	0.25	T	31.64
Camp Wright, Cal	10 7/12	0.01	0.02	0.40	1.20	6.53	11.41	8.92	6.50	5.22	1.95	0.77	0.22	43.15
Mendocino, Cal	14 11/12	0.05	0.03	0.47	2.57	5.81	8.26	9.90	8.90	7.36	4.77	1.31	0.39	49.82
Smartsville, Cal	9 8/12	0.04	0.00	0.10	1.45	3.35	4.51	8.24	5.70	4.48	2.85	0.79	0.40	31.91
Truckee, Cal	15 10/12	0.14	0.04	0.12	1.44	2.45	4.48	6.18	5.24	4.42	2.74	0.99	0.36	28.60
Nevada City, Cal	22 10/12	0.04	0.03	0.54	1.82	6.77	12.09	10.93	7.68	8.57	5.14	2.06	0.60	56.27
North Bloomfield, Cal	16	0.12	0.02	0.60	2.90	5.84	9.83	9.37	7.81	7.58	5.73	2.04	0.64	52.48
Bowman's Dam, Cal	14 8/12	0.20	0.02	0.71	3.65	7.94	14.00	14.00	11.07	10.77	7.78	2.59	0.83	73.56
Boca, Cal	12 10/12	0.21	0.00	0.02	0.58	0.94	2.47	4.38	3.23	3.28	1.69	0.46	0.13	17.39
Kono Tayee, Cal	12 8/12	0.00	0.01	0.19	1.02	4.21	2.53	4.86	3.34	3.68	1.16	0.52	0.29	21.81
Alta, Cal	15	T	0.00	0.36	2.25	4.81	5.98	9.08	7.76	7.74	3.77	1.48	0.47	43.70
Cisco, Cal	14	0.13	0.00	0.32	2.52	4.21	8.66	11.66	10.56	9.97	5.78	2.74	0.89	57.44
Summit, Cal	14	0.09	0.01	0.24	2.56	2.96	7.88	8.70	9.36	7.74	5.88	1.84	0.60	47.86
Healdsburgh, Cal	1 10/12	0.00	0.05	0.01	0.02	2.57	15.22	5.52	9.21	0.00	0.00	0.00	0.12	32.72
Sanoma, Cal	1 8/12	T	0.00	T	0.95	6.83	3.41	4.89	6.02	1.15	3.54	0.29	0.00	27.08
Sutter Creek, Cal	12 7/12	0.03	0.02	0.26	1.80	3.88	4.28	6.56	4.91	4.90	4.78	1.33	0.44	33.19
Rio Vista, Cal	7 7/12	0.00	0.01	0.20	0.80	2.07	3.16	3.08	1.54	2.78	2.34	0.75	0.21	16.94
Mount Diablo (near) Cal	2 6/12	0.00	0.00	0.00	0.57	4.73	1.06	5.16	3.44	0.58	0.22	0.29	0.22	16.27
East Brother Island, Cal	10 6/12	0.00	0.00	0.04	0.30	1.45	1.01	1.71	0.99	0.86	0.74	0.26	0.11	7.47
Calaveras Valley, Cal	4	0.00	0.00	0.26	1.42	1.43	1.34	3.80	4.28	5.48	5.33	1.85	0.40	25.59
Midway, Cal	2	0.00	0.20	0.29	0.55	2.52	2.11	0.50	0.39	0.06	0.00	0.00	0.00	6.62
Grayson, Cal	14	0.00	0.00	0.01	0.47	1.23	2.70	2.21	1.78	1.62	1.22	0.44	0.17	11.85
Hill's Ferry, Cal	6	0.00	0.00	0.13	0.35	1.78	1.89	1.70	1.41	2.03	1.55	0.70	0.27	11.81
Langworth, Cal	4	0.00	0.00	0.16	0.79	2.30	2.55	2.38	1.16	2.98	2.84	0.12	0.24	15.52
La Grange, Cal	19	0.00	0.00	0.16	0.85	2.05	2.80	2.86	2.83	2.40	1.87	0.65	0.07	16.54
Fort Point, Cal	15	0.01	0.00	0.05	0.56	1.67	4.37	4.07	2.93	1.90	1.20	0.56	0.02	17.36
Farrallons Island, Cal	6	0.00	0.00	0.18	1.06	2.52	3.54	2.97	2.00	2.35	2.23	0.74	0.50	18.1[illegible]
San Andres, Cal	16	0.01	0.00	0.28	1.88	4.11	10.34	9.06	8.15	6.73	3.81	1.31	0.37	46.05
Crystal Springs, Cal	9	0.03	0.00	0.23	1.95	3.19	5.29	7.77	6.54	7.14	4.07	1.36	0.51	38.08
Pilarcitos, Cal	20	0.03	0.00	0.39	2.01	6.09	12.35	11.02	8.77	7.86	4.03	1.79	0.49	54.83
Woodside, Cal	2 6/12	0.00	0.02	0.16	1.27	5.90	9.47	5.71	2.74	4.78	4.55	0.41	1.12	36.13
Mount Hamilton, Cal	3 8/12	0.00	0.04	0.25	3.03	1.88	4.57	3.68	6.06	6.05	4.54	2.34	1.31	33.75
Los Gatos, Cal	2 4/12	0.02	0.00	0.03	0.49	6.99	4.00	6.41	5.60	1.68	3.59	0.15	T	28.96
Wrights, Cal	1 5/12	0.00	0.00	0.00	1.32	8.45	4.74	7.91	4.48	2.60	11.32	0.00	0.00	40.82
Santa Clara, Cal	6	0.00	0.01	0.03	0.59	1.62	2.55	2.05	1.70	2.97	1.50	0.52	0.39	13.93
Central Point, Cal	7	T	T	0.08	0.32	1.35	1.61	1.52	1.05	1.85	1.29	0.48	0.20	9.75
Livingston, Cal	1 4/12	0.00	0.00	0.00	0.16	0.53	0.46	1.71	1.22	1.12	2.42	0.00	0.00	7.62
Athlone, Cal	1 5/12	0.00	0.00	0.00	0.32	0.92	1.00	1.62	1.81	1.50	2.40	0.00	0.00	9.57
Los Baños, Cal	11 8/12	0.02	T	0.04	0.21	1.46	0.74	1.61	1.08	1.20	0.77	0.28	0.13	7.54
New Idria, Cal	4 5/12	0.01	0.00	0.08	0.55	2.09	3.21	2.18	2.43	5.56	3.54	0.76	0.85	21.26
Big Doy Creek, Cal	7 4/12	0.05	0.00	0.02	0.67	1.47	3.23	3.84	3.36	3.17	0.45	0.22	0.11	16.59
Buchanan, Cal	4	0.00	0.00	0.89	0.46	0.81	3.33	2.60	3.12	3.00	4.33	0.09	0.14	18.77
Hamptonville, Cal	1 8/12	0.00	0.00	0.00	2.23	1.09	4.24	1.71	3.18	2.29	3.42	0.70	0.10	18.96
King's River, Cal	5 7/12	0.00	0.00	0.06	0.92	0.83	2.20	2.42	3.00	2.67	2.78	0.81	0.31	16.00
Jolon, Cal	4 9/12	0.00	0.06	0.10	0.78	3.26	2.17	3.68	3.56	3.36	2.27	0.67	0.15	20.06
Lewis Valley, Cal	7 10/12	T	0.00	0.03	0.39	1.15	2.19	1.46	1.90	1.23	2.16	1.00	0.11	11.62
McClung Ranch, Cal	3	0.00	0.00	0.01	0.14	0.11	1.49	1.02	0.94	0.66	1.05	1.00	0.02	5.44
San Luis Obispo, Cal	16 11/12	T	T	0.03	0.72	1.95	4.53	4.68	3.75	2.81	2.05	0.35	0.14	21.01
Fort Harford, Cal	1 4/12	0.00	0.00	0.00	0.00	13.62	4.12	2.86	0.48	1.21	1.84	0.00	0.00	24.13
Santa Maria, Cal	1 11/12	0.00	0.00	0.00	0.03	4.68	2.31	0.98	3.46	0.98	1.87	0.00	0.00	14.31
Los Alamos, Cal	1 4/12	0.00	0.00	0.00	0.00	10.82	2.56	1.48	0.28	2.61	2.06	0.23	0.00	20.04

T denotes trace of rain-fall.

Average monthly and seasonal precipitation in California, etc.—Continued.

Place and State.	Years of record.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Average for season.
Aroyo Grande, Cal	1 8/12	0.00	0.00	0.00	0.00	12.38	4.13	2.40	0.77	1.05	1.78	0.00	0.00	22.51
Guadaloupe, Cal	1 7/12	0.05	0.00	0.00	0.07	4.73	2.05	1.65	2.25	1.42	2.61	0.00	0.00	14.83
Orange, Cal	1 4/12	0.00	0.07	0.00	0.02	2.84	1.22	6.80	1.83	1.18	1.55	0.33	0.00	15.84
Dorrney, Cal	1 6/12	0.00	0.38	0.00	0.00	0.72	0.87	1.28	2.98	1.69	2.88	0.04	0.00	10.84
Alosta, Cal	5 9/12	0.00	0.00	0.00	1.01	1.75	2.97	4.06	6.19	5.17	3.10	0.78	0.42	25.45
Needles, Cal	1	0.00	0.00	0.12	0.00	0.00	1.32	0.00	1.90	2.08	0.10	0.75	0.00	6.27
Lugonia, Cal	3 4/12	0.00	0.00	0.00	0.21	0.73	1.51	1.56	3.48	3.59	2.82	1.04	0.48	15.42
Camp Cady, Cal	2 2/12	0.35	0.65	0.00	0.05	0.40	0.15	0.27	0.50	0.56	0.25	0.05	T	3.23
Ontario, Cal	2 3/12	0.00	0.00	0.00	0.12	0.94	3.05	2.15	6.07	2.71	2.51	0.40	0.42	18.37
Rings Station, Cal	7 10/12	0.16	0.04	0.09	0.61	1.70	3.33	4.65	4.69	3.44	2.82	0.79	0.19	22.51
Fenner, Cal	1	0.00	0.00	0.06	0.00	0.00	2.40	0.15	1.32	2.25	0.15	1.09	0.05	7.47
Otay-Mesa (30 miles of), Cal	2 3/12	0.10	2.15	0.00	0.36	1.45	1.30	2.82	2.46	1.73	1.86	0.69	0.08	14.50
Campo, Cal	4 2/12	0.63	0.44	0.01	0.43	1.13	2.15	2.51	2.14	2.54	2.16	0.08	0.08	14.30
Fort Yuma, Cal	26 11/12	0.31	0.63	0.56	0.10	0.32	0.29	0.35	0.40	0.14	0.10	0.00	0.00	3.20
Julian, Cal	5	0.00	0.00	0.00	0.55	2.28	5.28	4.81	8.25	9.85	5.98	0.73	0.00	37.73
Escondido, Cal.	10 6/12	0.00	0.02	0.25	0.48	1.39	1.92	3.27	3.23	2.54	1.84	0.53	0.22	15.79
Whitewater, Cal	7	0.00	0.04	0.00	0.13	0.38	1.07	0.64	1.21	1.04	0.48	0.00	0.00	4.99
Eola, Oregon	1 8/12	0.12	2.00	1.87	2.27	4.40	8.54	10.71	3.21	3.67	2.74	1.56	0.58	41.67
Empire City, Oregon	5 10/12	0.42	0.24	1.24	3.00	4.02	7.25	6.81	7.41	3.11	2.94	1.60	1.28	38.82
Fort Klamath, Oregon	3 7/12	0.66	0.51	0.88	1.04	3.92	3.91	4.40	3.70	3.24	0.59	1.05	1.01	24.91
Pysht, Wash	3 3/12	0.94	1.31	6.00	6.74	7.31	11.56	12.95	8.02	3.96	2.93	2.45	2.35	66.52
Fort Spokane, Wash	2 11/12	0.31	0.29	0.76	0.85	1.00	1.30	1.38	0.72	0.85	1.05	T	0.99	9.50
Dayton, Wash	6	0.58	0.35	0.87	2.54	2.10	4.98	3.65	3.99	1.66	2.58	2.68	1.28	27.35
Fort Sherman, Idaho	5 5/12	0.43	0.05	1.10	2.02	2.73	2.59	2.88	1.70	1.39	1.51	1.90	1.04	19.34
Lewiston, Idaho	5 3/12	0.87	0.30	0.62	1.96	1.40	2.94	2.47	1.85	1.12	1.31	1.00	1.88	17.72
Fort Lapway, Idaho	2 11/12	0.27	0.26	1.32	0.52	2.25	3.02	1.37	1.42	1.43	0.87	1.24	2.98	16.95
Boisé City, Idaho	22 10/12	0.17	0.18	0.36	0.88	1.28	2.18	2.42	1.38	1.72	1.14	1.34	0.69	13.74
Eagle Rock, Idaho	2 9/12	0.75	0.51	0.59	1.60	1.20	2.18	3.38	1.26	1.61	2.41	0.72	0.80	17.01
Fort Missoula, Mont	2 6/12	0.67	0.24	0.94	2.57	0.72	2.21	3.78	1.30	0.89	0.91	0.66	2.13	17.02
Fort Bridger, Wyo	2 1/12	0.32	1.31	0.52	0.65	1.29	0.36	0.97	0.96	0.47	1.36	0.93	0.93	10.07
Reno, Nev	15 7/12	0.02	0.01	0.03	0.27	0.35	0.68	1.47	0.82	0.49	0.32	0.10	0.11	4.67
Wadsworth, Nev	6 11/12	0.08	0.03	0.02	0.16	0.41	0.71	0.63	0.34	0.51	0.44	0.18	0.29	3.80
Hot Springs, Nev	6 10/12	0.11	0.02	0.08	0.18	0.39	0.50	0.52	0.32	0.28	0.44	0.32	0.30	3.46
Browns, Nev	6 7/12	0.03	0.01	0.03	0.40	0.40	0.50	0.53	0.36	0.57	0.52	0.08	0.25	3.68
Humboldt, Nev	6 11/12	0.01	0.04	0.08	0.76	0.44	0.87	0.87	0.65	1.01	0.79	0.30	0.46	6.28
Winnemucca, Nev	8 4/12	0.18	0.09	0.31	0.70	0.93	1.14	1.01	1.01	0.75	1.07	0.83	0.85	8.87
Golconda, Nev	6 10/12	0.01	0.05	0.26	0.59	0.87	1.17	0.34	0.63	0.60	0.79	0.66	0.47	6.44
Battle Mountain, Nev	6 11/12	0.01	0.08	0.38	0.66	0.37	1.08	0.89	0.99	0.89	1.31	0.68	0.59	7.93
Beowawe, Nev	7	0.03	0.07	0.30	0.46	0.49	1.07	0.79	0.72	0.57	0.75	0.41	0.56	6.22
Palisade, Nev	6 10/12	0.13	0.18	0.32	0.75	0.67	1.60	1.09	0.96	0.88	0.85	0.60	0.50	8.53
Carlin, Nev	7	0.13	0.29	0.33	0.67	0.53	1.65	1.24	0.87	0.89	0.87	0.48	0.45	8.40
Elko, Nev	6 11/12	T	0.10	0.22	0.18	0.55	1.90	0.82	0.63	0.71	0.48	0.37	0.43	6.39
Halleck, Nev	6 7/12	0.05	0.06	0.09	0.41	0.76	1.11	0.82	0.94	0.98	1.24	0.72	0.22	7.40
Wells, Nev	6 11/12	0.23	0.37	0.22	0.95	0.54	1.02	1.00	0.61	0.83	1.27	0.84	0.55	8.46
Otego, Nev	6 4/12	0.14	0.35	0.26	0.57	0.54	1.41	0.98	1.16	0.83	1.15	0.70	0.32	8.41
Toano, Nev	6 10/12	0.06	0.12	0.26	0.46	0.49	0.92	0.57	0.63	0.83	0.94	1.08	1.37	7.73
Teconia, Nev	6 11/12	0.05	0.13	0.40	0.65	0.30	0.67	0.34	0.48	0.44	0.73	0.35	0.22	4.76
Pioche, Nev	4 11/12	0.22	0.92	0.09	0.54	0.42	0.83	0.48	0.33	0.32	1.07	0.17	0.92	6.31
Camp Halleck, Nev	1 10/12	0.42	0.19	T	1.33	0.00	1.33	1.27	0.61	1.54	1.49	0.66	0.47	9.32
Camp McGarry, Nev	1	0.00	0.22	1.14	1.24	1.81	3.45	2.46	0.41	2.78	0.43	3.72	0.28	17.94
Fort Churchizz, Nev	2 5/12	1.55	0.22	0.11	0.35	1.04	0.22	1.46	0.32	0.01	0.11	0.06	0.22	5.67
Ruby, Nev	1 9/12	0.59	1.82	0.53	3.33	0.94	1.76	2.24	0.23	1.63	1.57	2.04	0.59	17.27
Terrace, Utah	6 9/12	0.08	0.16	0.32	0.34	0.34	0.89	0.49	0.59	0.37	0.63	0.43	0.35	4.99
Kelton, Utah	6 8/12	0.11	0.33	0.40	0.60	0.30	1.03	0.41	0.88	0.40	0.90	0.22	0.43	6.01
Promontory, Utah	6 9/12	0.14	0.36	0.51	0.69	0.69	0.84	0.59	0.88	0.80	1.40	0.83	0.54	8.27
Blue Creek, Utah	6 11/12	0.39	0.55	0.63	1.03	0.47	1.23	0.87	0.80	0.56	1.30	0.92	0.52	9.27
Corinne, Utah	9 4/12	0.18	0.66	0.58	1.02	1.03	2.12	1.11	1.70	1.16	1.45	1.41	0.72	13.14
Ogden, Utah	6 7/12	0.02	0.31	0.63	1.62	1.02	1.65	1.82	1.77	1.18	1.87	0.92	0.70	13.51
Salt Lake, Utah	13	0.54	0.83	0.96	1.72	1.76	1.49	1.46	1.36	2.00	2.33	2.00	1.04	17.49
Nephi, Utah	1 10/12	0.82	0.52	0.92	2.15	0.85	3.70	0.86	2.70	1.71	4.66	1.90	0.30	21.09
Camp Floyd, Utah	2 6/12	1.40	0.34	0.69	0.66	1.23	0.16	0.28	0.63	0.50	0.60	0.65	0.26	7.40
Frisco, Utah	1 10/12	0.79	3.94	0.09	0.56	1.10	0.10	0.34	0.52	0.37	0.15	T	T	7.96
Tonaquint, Utah	2 6/12	0.63	0.83	0.56	1.08	0.75	1.12	1.43	0.79	0.33	0.28	0.55	0.03	8.38
Fort Mojave, Ariz	15	0.38	0.61	0.08	0.22	0.37	1.27	0.40	0.97	0.27	0.53	0.17	0.08	5.35
Prescott, Ariz	10 5/12	1.90	3.06	1.11	0.51	0.86	2.01	1.02	1.61	1.64	1.03	0.49	0.18	15.42
Fort Verde, Ariz	11 3/12	1.56	3.11	1.13	0.48	0.69	1.67	0.70	1.03	1.34	0.71	0.34	0.26	13.02
Fort Apache, Ariz	8 6/12	3.78	4.74	1.78	1.67	0.99	2.03	1.42	1.98	1.55	0.79	0.52	0.88	22.13
Fort Defiance, Ariz	8 5/12	2.44	2.73	1.86	0.70	1.16	0.87	0.98	0.70	0.84	0.67	0.52	0.74	14.21
San Carlos, Ariz	6 1/12	1.37	2.70	0.68	0.72	0.56	1.05	1.01	1.74	1.22	0.12	0.38	0.33	11.88
Fort Grant, Ariz	16 6/12	3.84	3.72	2.35	0.82	1.00	1.48	0.82	1.32	1.10	0.52	0.32	0.78	18.07
Fort Thomas, Ariz	7 3/12	1.60	2.64	0.64	0.42	0.32	1.30	0.62	1.27	1.09	0.27	0.59	0.36	11.12
Camp Goodwin, Ariz	1 6/12	3.47	3.73	5.85	2.27	2.40	4.97	4.80	2.03	1.87	1.33	1.01	0.00	32.78
Wickenburgh, Ariz	3 10/12	0.88	1.91	0.79	0.06	0.56	1.33	0.84	0.77	0.26	0.28	0.08	0.00	7.76
Phœnix, Ariz	10 6/12	0.68	1.02	0.70	0.26	0.51	1.07	0.53	0.90	0.71	0.37	0.12	0.10	6.97
Fort McDowell, Ariz	17 6/12	1.25	1.65	0.67	0.26	0.74	1.56	0.92	1.18	0.69	0.38	0.15	0.18	9.63

T denotes trace of rain-fall.

Average monthly and seasonal precipitation in California, etc.—Continued.

Place and State.	Years of record.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Average for season.
Pantano, Ariz	$5\frac{2}{12}$	1.85	2.91	1.52	1.04	0.34	0.91	0.81	1.40	0.68	0.18	0.29	0.47	12.40
Florence, Ariz	$3\frac{11}{12}$	0.79	1.88	0.96	0.32	0.62	0.94	1.06	0.69	0.46	0.31	0.02	0.02	8.07
Maricopa, Ariz	$3\frac{6}{12}$	0.39	0.86	0.39	0.76	0.32	1.00	0.42	0.75	1.17	0.27	0.12	0.10	6.64
Casa Grande, Ariz	$5\frac{3}{12}$	0.22	1.04	0.00	0.24	0.10	0.68	0.55	0.15	0.32	0.02	0.05	0.00	3.37
Fort Buchanan, Ariz	$2\frac{4}{12}$	6.22	6.92	2.27	1.33	1.00	1.22	1.25	1.43	0.15	0.98	0.00	0.34	23.11
Camp Wallen, Ariz	1	0.66	2.50	0.20	0.00	0.00	0.90	4.60	2.30	0.60	0.00	0.00	0.00	11.76
Wilcox, Ariz	$6\frac{1}{12}$	1.67	2.60	0.78	0.67	0.30	0.82	1.00	1.03	0.93	0.06	0.13	0.31	10.39
Fort Bowie, Ariz	7	2.95	2.83	1.17	0.85	0.77	1.52	1.49	1.78	1.49	0.08	0.39	0.58	15.90
San Simon, Ariz	$4\frac{11}{12}$	0.76	1.96	0.29	0.37	0.25	0.40	0.22	0.37	0.65	0.01	0.25	0.06	5.59
Benson, Ariz	$6\frac{3}{12}$	1.64	2.51	0.56	0.62	0.16	0.58	0.35	0.68	0.70	0.00	0.07	0.31	8.18
Lordsburg, N. Mex	$5\frac{3}{12}$	1.36	1.97	0.74	0.73	0.49	0.53	0.50	0.28	0.72	0.40	0.20	0.26	8.18
Burkes, Ariz	$2\frac{5}{12}$	0.02	1.41	0.57	0.02	0.41	0.70	0.15	0.52	0.13	0.18	0.00	0.00	4.01
Texas Hill, Ariz	$6\frac{1}{12}$	0.12	0.78	0.03	0.69	0.03	0.42	0.22	0.44	0.32	0.17	0.05	0.00	3.27
Deming, N. Mex	$4\frac{5}{12}$	1.44	2.00	1.28	0.58	0.58	0 6	0.40	0.00	0.25	0.04	0.15	0.37	8.29

T denotes trace of rain-fall.

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